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THE UNIVERSITY OF ALBERTA

LOCUS OF CONTROL, FIELD ARTICULATION, AND EDUCATIONAL PLACEMENT FOR ELEMENTARY SCHOOL BOYS

by

DAVID CLARK HONSBERGER ©

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled LOCUS OF CONTROL, FIELD ARTICULATION, AND EDUCATIONAL PLACEMENT FOR ELEMENTARY SCHOOL BOYS submitted by David Clark Honsberger in partial fulfilment of the requirements for the degree of Master of Education in Special Education.

R.S. Mac Arthur
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Date 25 May, 1976

ABSTRACT

The primary intent of this research study was to investigate the usefulness of two of the more popular conceptualizations of "personal style." The two styles involved in the study were Rotter's locus of control construct and Witkin's field articulation personal style.

Specifically, this study investigated the convergent and discriminant validity of two locus of control and two field articulation measures. The Intellectual Achievement Responsibility (IAR) questionnaire and the Nowicki-Strickland Locus of Control Scale for Children (NSLCSC) were the locus of control instruments used. Field articulation was measured by the Children's Embedded Figures Test (CEFT) and Oltman's Portable Rod and Frame Test (PRFT). At the same time, the theoretical similarity of the two personal styles was assessed by the intercorrelations of the locus of control and field articulation measures.

A second purpose of the study was to investigate any differences between special education and regular classroom boys on measures of the two style constructs.

To study these research questions, a sample of 71 nine to eleven year old boys was selected. The total sample was made up of a group of special education boys in adaptation classes for the learning disabled, and a group of boys in regular grade 5 classrooms. A test battery including the four personal style measures, WISC Information and Vocabulary subtests and the Blishen Socio-Economic Index was administered to each boy.

Results showed virtually no convergent validity of the locus of control measures. The field articulation measures correlated significantly suggesting that a common dimension was being tapped. However, different correlational patterns for the CEFT and the PRFT were some indication that different factors were involved in the two tests.

The correlations between the two styles were low and insignificant implying that locus of control and field articulation, as measured by the instruments in this study, are separate psychological dimensions.

The special education boys and the regular classroom boys scored similarly on all of the personal style measures except the CEFT. It was suggested that the low CEFT scores of the special education boys might be a function of poor attention and lower general intellectual ability.

The research results suggest that the theoretical personal style constructs have not yet been adequately translated into valid measurement devices. Descriptive research and educational programs using the locus of control and field articulation personal styles may be somewhat premature. It is essential, first, that the broad generality of these personal styles be more strongly indicated. The usefulness of the two styles is also dependent on the demonstration of construct validity and adequate reliability of the personal style measures.

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Chapter I

INTRODUCTION

Study of human performance has consistently shown that factors other than ability *per se* are involved in the degree of excellence of the performance. The unique personality and motivational characteristics of the individual influence his performance to a considerable extent. Increasingly, the role of these 'style' factors in academic functioning is being acknowledged.

A wide variety of behavioral continua has been described as "personal styles" by different theorists. Personal style is a psychological construct that describes "consistencies in individual modes of functioning in a variety of behavioral situations" (Coop & Sigel, 1971). Some of the better known style constructs for children include the impulsive-reflexive dimension (Kagan, Rosman, Day, Albert & Phillips, 1964), internal-external locus of control (Rotter, 1966) and the global-articulated style proposed by Witkin, Dyk, Faterson, Goodenough and Karp (1962).

The use of a personal style approach for behavioral explanation and for the practical problems of educational assessment and programming has generated considerable interest. Keogh (1973) has speculated about the role of personal styles in education:

> It is presumed that [personal] styles interact with instructional strategies to facilitate or to impede learning. Inclusion of [personal] style as a significant variable in planning curricula and instructional programs may maximize learning efficiency [p. 84].

Similarly, Witkin (1972) has suggested that a personal style approach can provide a more comprehensive and less judgmental assessment of abilities than current ability tests offer. Witkin further proposed that measures of general personal styles could be combined in order to identify a person's style "map" — an individual's unique constellation of attributes and abilities.

The practical applications of the personal style approach must await the validation of the measures of these styles. As is often the case, people are quick to accept theoretically derived traits as reality before they can be empirically tested. It is frequently difficult, however, to translate the face validity of a theoretical construct into valid and reliable measurement devices. When several measures of a single construct are derived, it is crucially important that these tests are shown to be measuring similar attributes.

It is the thesis of this research study that the convergent and discriminant validity of the measures of personal style must be demonstrated before further research involving these style constructs is undertaken. The focus of this study is restricted to two of the more well known and potentially useful conceptualizations of personal style. One of the styles that was studied was Rotter's (1966) locus of control construct. The second was the field articulation personal style proposed by Witkin and his associates (1962).

To investigate the convergent validity of the tests of personal style, two measures of each style were utilized. A primary purpose of the present research was to investigate the extent of the relationship between different measures of the same style.

There is some theoretical and empirical support for the hypothesis that locus of control and field articulation styles are tapping similar behavioral domains. It was the intent of this research to investigate the distinctiveness of these two styles by observing the extent of the intercorrelations of the two style constructs. At the same time, the discriminant validity of the *measures* of these personal styles can be assessed by comparing the degree of between-trait correlations to within-trait correlations (Campbell & Fiske, 1959).

Considerable evidence exists to suggest that children in classes for the learning disabled will score differently from their regular classroom peers on the measures of the locus of control and field articulation personal styles. A second major purpose of this research, thus, was to investigate any differences between special education and regular class groups on measures of the two style constructs.

The learning disability field has been wracked since its inception with the difficulty of adequately defining and describing this rather heterogeneous group of children (Siegel, 1968). Most of the definition attempts have focused on deficiencies of perceptual and cognitive abilities, although in desperation, definitions such as the following have also been proposed: "A child with a learning disability is any child so labelled for whatever reason" (Towne & Joiner, 1968, p. 217). It is suggested that individual personal styles, or style "maps," which bridge the areas of personality and cognition, may be of great use in differentiating the successful and unsuccessful school achiever.

Hopefully, the quest for all-inclusive definitions of the learning disabled child will be abandoned in favour of individual assessments of specific strengths and weaknesses. In this endeavour, a personal style approach may be of particular value.

Thus, this study proposes to: (1) investigate the convergent and discriminant validity of the locus of control and field articulation personal styles; (2) investigate the theoretical similarity of the two style constructs by observing the extent of the intercorrelations of the locus of control and field articulation measures; (3) investigate differences between special education and regular classroom boys on measures of the two personal styles.

To study the questions that have been outlined above, 71 nine to eleven year old boys were tested. The total sample consisted of a group of special education boys in adaptation classes for the learning disabled, and a group of boys in regular grade 5 classes. Included in the test battery were two tests each of the locus of control and field articulation personal styles as well as verbal measures of general intelligence and an index of socio-economic status.

Chapter II

REVIEW OF RELATED THEORY AND LITERATURE

Locus of Control

It matters not how strait the gate
How charged with punishments the scroll,
I am the master of my fate:
I am the captain of my soul.
William E. Henley (1849-1903)

Evolution of the Locus of Control Personal Style

Locus of control is a construct that has evolved from the social learning theory of Rotter (1954; 1966). Rotter suggested that the classic laws of learning developed in animal research could not be directly translated to the human situation. For animals, expectation of future reward is largely due to the strength and frequency of reinforcement in a particular situation. For humans, however, other factors seem to be involved. Rotter observed that the effects of reinforcement on behavior depended, in part, on whether a person perceived reinforcement as dependent on his behavior, or as due to forces beyond his control. Performances differed in situations perceived as chance or as skill determined. For example, Phares (1957), using an ambiguous colour matching experimental task, found that expectancy of success varied considerably for subjects who perceived the task as skill determined compared to those who perceived success at the task as a matter of luck or chance. Reinforcements under skill conditions, compared to chance conditions, had a significantly greater effect on raising or lowering expectancies for future reinforcements. James and Rotter (1958) studied the extinction of verbal expectancies in an extra-sensory perception type of experimental task. The authors found that the usual superiority of partial over continuous reinforcement in trials to extinction was true only for the subjects who were given chance instructions. For those subjects who perceived the task as skill-determined, the number of trials to extinction for the 100% reinforcement group was significantly greater than for the partial reinforcement group. Presumably, subjects in the different conditions had different perceptions of the origins of the reinforcements they were receiving and this affected the rate of extinction of their expectancy for success.

Rotter suggested that people develop a generalized expectancy of reinforcement being either relatively contingent on one's actions, or relatively independent of personal effort. The polar extremes of this continuum of beliefs were labelled internal and external control.

> As a general principle, internal control refers to the perception of positive and/or negative events as being consequences of one's own actions and thereby under personal control; external control refers to the perception of positive and/or negative events as being unrelated to one's own behaviors in certain situations and thereby beyond personal control (Lefcourt, 1966, p. 207).

It is important to note that locus of control is a *generalized* expectancy, the product of an individual's unique social learning experiences. In any specific situation, one's locus of control is "but one element of a behavioral prediction formula which also includes reinforcement value and situational determinants" (Lefcourt, 1972, p. 2).

Evaluation of the Locus of Control Personal Style

The worth of any personal style construct is measured by its usefulness in explaining or predicting behavior. The usefulness of locus of control as an explanatory construct has been questioned for a number of reasons. Strict behaviorists might suggest that the belief in personal control is illusory and of no consequence (e.g. Skinner, 1971). Lefcourt (1973), however, has argued that illusions of freedom and of control do have important consequences for behavior and should be acknowledged in any attempt to describe that behavior. It would seem that expectancy of control or lack of control is an important determinant of behavior.

The usefulness of the locus of control construct has been questioned by some for its focus on a generalized expectancy. Mischel (1973) argued that generalized "traits" are of limited value in explaining behavior. He suggested that personality theorists shift their attention from global traits to the "individual's cognitive activities and behavior patterns, studied in relation to the specific conditions that evoke, maintain and modify them and which they, in turn, change" (p. 265). It seems likely that expectancies of personal control are situation-specific in many instances. The generalized locus of control construct, then, may be restricted to prediction of behavior in unstructured, ambiguous situations, and descriptions of 'average' behavioral tendencies. This limitation of Rotter's style construct for behavioral prediction in specific settings should be acknowledged.

A third criticism of the locus of control construct, related to the second one just discussed, concerns the global nature of the concepts of internal and external control. These general terms subsume a number of importantly different factors. Kukla (1970) suggested that the idea of internal control includes outcomes due to individual ability as well as those due to individual effort. Similarly, a belief in external control may be due to such factors as the difficulty of the task, or the degree of chance involved. Collins, Martin, Ashmore and Ross (1973) factor analyzed Rotter's IE scale along with a number of other measures of the "internal-external metaphor" in personality theory. Their results indicated essentially two types of Rotter internal. One type was high in beliefs in predictability and stability of behavior and low in an "other direction" factor. The second type was high on an "inner direction" factor as well as having strong feelings of constraint on behavior. Lao (1970) believes that the two factors of personal control and system blame are included within the locus of control construct. All of these authors have pointed to the need for refinement in the measurement of internal-external control. Their suggestion, shared by the present writer, is that the locus of control style construct is often a relevant and important variable for behavioral prediction. However, frequently, the measurement of this style is insufficiently precise to permit a useful analysis of behavior.

In sum, locus of control is considered an important psychological construct for describing human behavior in certain contexts. In relatively undefined situations presenting a number of behavioral alternatives, style factors, such as internal-external control, are used to provide decision guidelines for behavior. These styles have evolved as a function of the individual's history of social learning experiences. There is some indication that the measurement of locus of control is not always sufficiently precise to allow for substantial behavioral prediction.

Selective Review of Locus of Control Research

The original investigations of Rotter and his associates were conducted with adult subjects. Since that time, however, a great deal of locus of control research has focused on children, frequently in educational settings. This section of the report will briefly and selectively review some of the locus of control research that is pertinent to the present study.

Research of the internal-external dimension has consistently found developmental trends from an external control orientation to an increasingly internal outlook (Bialer, 1961; Fox, 1972; Lawrence & Winschel, 1975, Lifshitz, 1973; Share, 1972). There have been suggestions (e.g. Lawrence & Winschel, 1975) that there are specific developmental stages involved in the growth of an internal locus of control. However, as yet, available evidence is not sufficient to differentiate stages within the developmental progression from external to internal control beliefs.

Children's locus of control orientations appear to be closely related to home atmosphere. The consensus of a number of investigations (Davis & Phares, 1969; Katkovsky, Crandall & Good, 1967; MacDonald, 1971; Samson, 1972) is that internal children tend to come from homes that are warm, supportive, consistent in discipline, and where early independence is encouraged. Children with an external orientation, on the other hand, are more likely to come from less supportive homes, and tend to perceive their parents as authoritarian and as inconsistent disciplinarians. Kifer's (1975) research suggests that the child's perceptions of 'home concern' are highly related to personality characteristics, such as locus of control, in the early school years. The more parents are concerned and involved in their child's activities, the more internal are the child's beliefs about his control of reinforcements.

Another consistent research finding concerns differences in control orientation dependent on the socio-economic status (SES) of the subjects (Bartel, 1971; Shaw & Uhl, 1971; Stephens, 1971). On the whole, children (and adults) from lower SES milieus tend to be more external in their outlook than their counterparts in upper middle class settings. This finding is not a unanimous one, however, as some studies (e.g. DuCette & Wolk, 1972; Solomon, Houlihan & Parelius, 1969) found no differences due to a social class variable. It has been suggested by Gurin, Gurin, Lao and Beattie (1969) that an external orientation is realistic and appropriate for those persons with less objective access to reinforcements. That low SES children are inferior on the locus of control scale, as well as on many other behavioral measures, is a fact that should be interpreted with some caution. Costello and Peyton's (1973) observations on this issue are noteworthy:

> In a society that is based on a concept of social class, it becomes conceivable that we would arrive at a few dimensions of behavior and that one be "superior". That we have succeeded in demonstrating social class differences in many cognitive styles, and that the lower class groups always come out "inferior", cannot be accidental, even if it is not planned. Understanding psychological research findings in light of cultural history is a loaded challenge [p. 69].

An unresolved issue in the research literature is the nature of sex differences in locus of control orientation. In general, locus of control tends to be a better predictor variable for boys than for girls (Bauer, 1975; Bottinelli & Weizman, 1973; Katkovsky & Preston, 1962; Lintner & DuCette, 1974; Nowicki & Strickland, 1973; Stephens, 1972). Research in other areas has tended to show that motivation and personality variables influence male performance more than female (Faust, 1970). This pattern of sex differences has not been consistently found in the research, however (McGhee & Crandall, 1968; Wolfgang & Potvin, 1973). There is some evidence that girls are more internal than boys on the Intellectual Academic Responsibility (IAR) locus of control questionnaire (Crandall & Lacey, 1972; Crandall, Katkovsky & Crandall, 1965; Solomon, Houlihan & Parelius, 1969).

A large number of studies have related the locus of control style construct to various school-related behaviors. Many studies have indicated that internal students perform better than external students on measures of school achievement (Bauer, 1975; Chance, 1972; Coleman et al., 1966; McGhee & Crandall, 1968; Messer, 1972; Nowicki & Strickland, 1973; Shaw & Uhl, 1971; Shipe, 1971; Strickland & Nowicki, 1971; Wolfgang & Potvin, 1973).

There are a number of possible reasons for internals' relative academic superiority. The first possibility is that internality is associated with a set of other behaviors that contribute to school achievement, as well as eliciting favourable teacher response. The following writers would support such a position: Wolfgang and Potvin's (1973) research suggests that amount of class participation is positively related to locus of control: internals tend to participate more than externals. Gozali, Cleary, Walster and Gozali (1973) found that internal children made more appropriate use of their time in a test taking situation. Stephens (1971) found that internals were more reflective and persistent. Baron, Cowan, Ganz and MacDonald (1974) hypothesized that internal children would be less likely to demand personal attention from the teacher. This would likely lead to greater teacher satisfaction with his internal students than with his external students.

A second possible reason for the better academic performance of internal children is provided by Baron et al. (1974). Based on findings that internals are better self-reinforcers than externals, they suggest that the internal students' superiority

> . . . may reflect the fact that in situations where reinforcement is normatively chaotic in terms of providing discriminable contingencies and variable in frequency, persons who more effectively mediate their own reinforcements (i.e. internals) can better compensate for impoverished conditions of extrinsic reinforcement [p. 290].

The direction of the relationship between locus of control and academic achievement is not easily described. Many authors would suggest that an internal locus of control predisposes a child towards school achievement. On the other hand, a number of writers (Epstein & Komorita, 1971; Kifer, 1975; McGhee & Crandall, 1968; Messer, 1972) argue that it is the child's history of academic successes and failures which affects his beliefs about control of reinforcement.

> Children enter school with little knowledge of what to expect and spend years receiving, mainly from extrinsic sources, feedback about their successes and failures . . . . In the process of developing patterns of successful and unsuccessful accomplishments, students begin to accept views of themselves and their abilities [Kifer, 1975, pp. 193-194].

Undoubtedly, the relationship between locus of control and academic achievement is bi-directional. Both control beliefs and achievement influence and are influenced by each other. As well, there is likely an interaction with such variables as self-esteem (Epstein & Komorita, 1971) and home concern (Kifer, 1975).

Ellis (1971) found significant relationships between reading discrepancy age (defined as the difference between reading age and mental age in months) and the Children's Locus of Control Scale for children in grades 4 and 6. Internal children tended to have greater reading success than external classmates. In Shaw and Uhl's (1971) research with second grade children, reading scores were related to internality only for the white, upper-middle SES group.

There are inconsistent reports concerning the relationship of locus of control measures and intelligence. Some authors (Shaw & Uhl, 1971; Stephens, 1972; Strickland & Nowicki, 1971) have reported weak, insignificant relationships. Others have found a relationship only for certain subgroups within their samples (Bauer, 1975; Crandall, Katkovsky & Crandall, 1965; Share, 1972). Still others have found significant positive correlations between locus of control orientation and IQ (Crandall & Lacey, 1972).

The relationships of locus of control with reading success and with general intelligence again invite the question of directionality. The reasonable assumption, once more, is that the relationships are reciprocal.

In experimental situations with adult subjects, internality-externality has been related to a tendency to seek information (Davis & Phares, 1967), and use information (Phares, 1968). Other reports indicate a relationship of locus of control with attention in skill determined tasks (Lefcourt, Lewis & Sherman, 1968; Lefcourt & Wine, 1969), time spent on skill problems (Rotter & Mulry, 1965), and verbal fluency (Brecher & Denmark, 1969). In all cases, it was the internal subjects who presented the presumably more adaptive behaviors.

It is tempting, in view of the developmental trend towards internality and the reported superiority of internal subjects in many school-related behaviors, to assume that an internal locus of control is a more mature belief state (e.g. Lawrence & Winschel, 1975). Certainly, this assumption has guided many research studies (Janzen & Beeken, 1973). The temptation to explain personal style in the context of a "good—bad" continuum must be resisted however. As Witkin and Berry (1975) have commented (with reference to the field articulation construct), a developmental progression from one mode to another does not imply superiority for the later-developing mode. Rather, one orientation can be judged as more or less useful depending on its adaptive value in a particular setting. An external locus of control, for example, tends to be adaptive in situations requiring helping, affective responses (Phares & Lamiel, 1975).

Field Articulation

Evolution of the Field Articulation Personal Style

The field articulation construct has evolved from research by Witkin and his associates concerning individual differences in perception (e.g. Witkin, 1950; Witkin & Asch, 1948; Witkin, Lewis, Hertzman, Machover, Meissner & Wagner, 1954). This research indicated that some people are able to overcome the influence of a perceptual field by differentiating parts from the whole, while others tend to be influenced by the context or background. These two styles of perception have been labelled field independence and field dependence respectively.

Further research indicated that these characteristic individual differences in perception were markers for typical cognitive and social behaviors as well. These findings led Witkin to propose a theory of psychological differentiation (Witkin et al., 1962). Briefly stated, the theory hypothesizes a developmental progression towards a differentiated state characterized by a separation of psychological functions (e.g. perceiving from feeling; thinking from actions), an ability to analyze and structure experience (articulation), and a separation of self from environment. The characteristic behaviors at each end of the differentiation continuum have been summarized by Gruenfeld, Weissenberg and Loh (1973):

> At the articulated end of the continuum, the characteristic intellectual behavior is analytic-systematic, the perceptual behavior is discriminating, the emotional behavior is self-controlled, the social behavior is independent and self-reliant, and the motivational behavior is active and focused. At the global end of the continuum, the characteristic intellectual behavior is intuitive, the perceptual behavior is undifferentiated, the emotional behavior is impulsive, the social behavior is dependent and other directed, and the motivational behavior is passive and diffused [p. 42].

Witkin et al. (1962) suggest that the social and cognitive 'styles' of the global or articulated person can be assessed through performance on perceptual field independence tests. This assumption is based on considerable research showing consistency in level of differentiation across such diverse psychological areas as perceptual and intellectual functioning, body concept, sense of separate identity, personal defences, and impulse control (Fig. 1).

Because tests of perceptual field independence are used to assess the level of differentiation, many authors use the terms "field independent" and "field dependent" to label the two extremes of differentiation. Strictly speaking, the terms "articulated" and "global" are appropriate when referring to individual behavioral differences across psychological

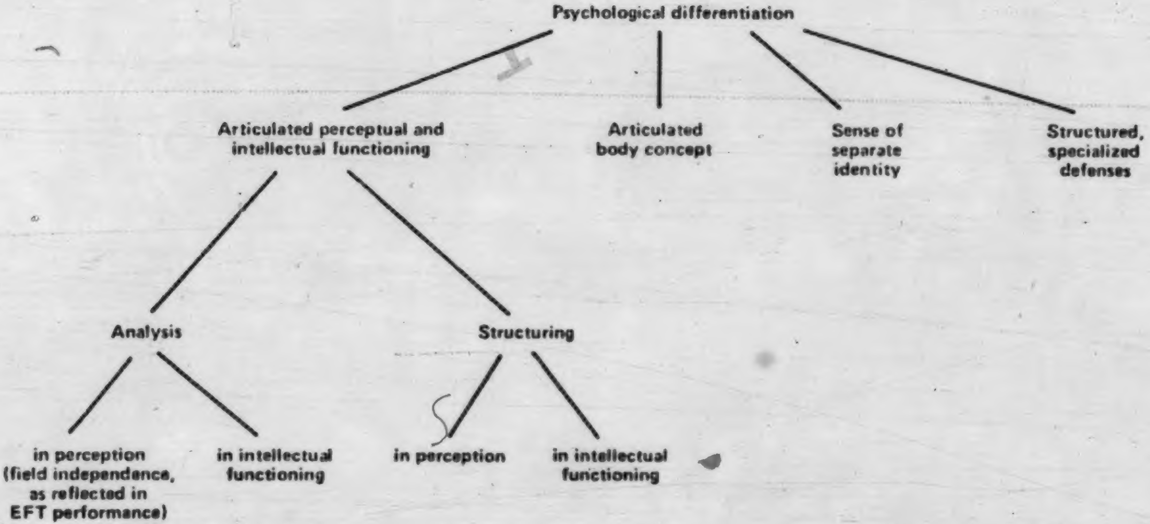
Psychological differentiation
Articulated perceptual and intellectual functioning
Articulated body concept
Sense of separate identity
Structured, specialized defenses
Analysis
Structuring
in perception (field independence, as reflected in EFT performance)
in intellectual functioning
in perception
in intellectual functioning

Figure 1. Overview of the psychological differentiation construct.*

"From Witkin, H.A., Oltman, P.K., Raskin, E., & Karp, S.A. *A Manual for the Embedded Figures Tests.* Pao Alto, California: Consulting Psychologists Press, 1971, p. 14.

domains other than perception. Both sets of terms will be used interchangeably in this report.

In the early research of Witkin and his associates (1962) a battery of three tests was developed to measure perceptual field independence. The Embedded Figures Tests (EFT) require that a subject discover simple figures which have been embedded in complex geometric backgrounds. The Rod and Frame Test (RFT) consists of a luminous rod suspended within a luminous square frame. Inside a darkened room, the subject is required to bring the rod to a vertical position despite the tilted position of the frame. The third test of the battery is the Body Adjustment Test (BAT). In the BAT, the subject is strapped in a chair that is tilted from the vertical while inside a room that is also tilted from the vertical, either in the same or the opposite direction. The subject asks the experimenter to adjust the chair until the subject perceives himself to be in an upright position. It was found that these instruments correlated significantly with each other and appeared to be measuring the common ability of isolating an object, whether figure, rod, or one's own body, from a background field.

Subsequent research of the differentiation hypothesis has frequently used the Block Design subtest from the Wechsler intelligence scales and the Draw a Person (DAP) Test (Witkin et al., 1962) as indicators of the global-articulated continuum. A number of adaptations of the Witkin original tests have also been developed. The measures of field articulation in the present study were a children's version of the EFT and a portable table-top adaptation of the RFT. These two measures will be fully described in a later chapter.

Evaluation of the Field Articulation Personal Style

The field articulation construct has been used extensively in recent years to explain and predict behavioral differences in various settings and situations. The construct, however, has not been without its critics. A number of these criticisms of the field articulation individual style will be considered.

There is some evidence that the original battery of the EFT, RFT, and the BAT may not be tapping a similar factor. Vernon's (1972) research with grade eight students showed that the EFT and a number of similar tests involving visual embeddedness loaded on a general visualization factor, while the rod and frame test involved a relatively independent visuokinesthetic factor. A number of authors (e.g. Dreyer & Dreyer, 1971; Keogh & Ryan, 1971; Nesbit, 1973) have reported only moderate correlations between these two tests of field independence for elementary school children. Further investigation is necessary before the distinctiveness of field independence as a style factor is established. Until that time, caution should be shown in the interpretation of field articulation research when only one test of articulation is being used.

Other authors have suggested that field independence, particularly as measured by the EFT, may be little more than a measure of spatial ability (Horn, in press; Sherman, 1967), or general intelligence (Dubois & Cohen, 1970; Kagan & Kogan, 1970; Vernon, 1972; Wachtel, 1972; Zigler, 1963a,b). Although Witkin and Berry (1975) have argued that field independence and spatial abilities are separate dimensions, the evidence to date is far from conclusive one way or another. It remains to be seen whether the cluster of attributes found along the global-articulated continuum may be more parsimoniously ascribed to individual differences in spatial ability or general intellectual functioning. The resolution of this question is complicated by the fact that it is statistically and logically difficult to remove the influence of cognitive ability from a personal style which is in the cognitive domain. To the present writer, the psychological dimension now labelled field articulation can be an important variable for behavioral explanation. The appropriate 'labelling' of the articulation construct is an important issue but separate from the issue of the *usefulness* of the articulation dimension, as it is now known.

Wachtel (1968, 1972) has argued that the tests of field independence do not offer the subject a choice or preference of response. Thus, these tests are measuring an *ability* rather than a *style* of functioning. In the perceptual and cognitive spheres, this is certainly so. If, however, one accepts the differentiation hypothesis, there are a number of social, emotional and motivational style differences that are being tapped. Perhaps the term "style" is most appropriately used in reference to these non-intellectual variables that are inferentially associated with field independence—field dependence.

Gardner (1963) has suggested that the distinction between preference and ability is largely artificial. Present cognitive abilities can be viewed as the result of earlier strategic "choices." We are only able to observe cognitive structures that have been "shaped earlier both by learning and by constitutional characteristics of the apparatuses of thought" (p. 117). Gardiner observed that the real issues are those of cognitive structure formation.

Sherman (1967) has expressed some misgivings about the use of the term "analytical" to describe field independent persons. It implies a generality that is unwarranted in view of the fact that, for example, performance on verbal embedded tasks is not related to measures of field independence (Kagan & Kogan, 1970). It must be acknowledged that the term "analytical," as Witkin uses it, applies only to those areas of function that Witkin has specifically studied, many of which are spatial in nature.

One other limitation of the articulation style construct will be mentioned. A number of writers have noted that a field independent orientation, while developmentally more mature, is not always the most adaptive mode in certain situations (Arbuthnot, 1971; Wachtel, 1968). A person who steadfastly maintains a field independent approach, regardless of situation, is less effective and adaptive than the predominantly field independent person who is able to adopt a field dependent style on occasion. Arbuthnot has suggested that the measurement of a global—articulated style would be made more sophisticated with the inclusion of a "fixity-mobility of functioning" dimension. These distinctions appear to be useful ones, worthy of consideration for future revisions of articulation style measures.

In summary, the field articulation personal style has evolved from observations of individual differences in perception. The differentiation hypothesis was developed to account for individual differences on a number of other non-perceptual traits which were closely related to the original field independence tasks. There have been some questions raised about the internal consistency of the articulation style, and the independence of field articulation from measures of spatial visualization or general intellectual ability.

Selective Review of Field Articulation Research

Research has indicated a developmental progression from a relatively field dependent state towards greater field independence (Bigelow, 1971; Campbell & Douglas, 1972; Witkin et al., 1962). This trend is evident until mid-adolescence at which time developmental curves level off (Faterson & Witkin, 1970; Witkin, Goodenough & Karp, 1967). Sometime in middle age, there appears to be a return to field dependence (Witkin et al., 1962). Despite the general increase in differentiation during childhood, individuals tend to maintain the same relative position among their peers on the measures of field articulation (Faterson & Witkin, 1970; Witkin, Goodenough & Karp, 1967).

Children's level of differentiation is closely related to the home environment. Field independent subjects tend to come from homes that encourage independent functioning (particularly from the mother), are perceived as warm and supportive, and encourage the development of impulse control (Dyk & Witkin, 1965; Witkin et al., 1962). Parents of field dependent children, on the other hand, typically emphasize adherence to parental expectations and authority.

The relationship of socio-economic status with field articulation is not clear. Karp, Silberman and Winters (1969) found no SES differences on the EFT for twelve year old boys. Ramirez and Price-Williams' (1974) cross-cultural sample of fourth grade children also did not show any SES effect using the portable rod and frame test. However, both Bigelow (1971) and Mumbauer and Miller (1970) found significant SES differences on the Children's Embedded Figures Test (CEFT) for samples of young children. The effect of SES in Mumbauer and Miller's study disappeared when IQ was held constant, suggesting that the SES differences may be due, in part, to the sizeable relationships for both SES and measures of field articulation with general intelligence.

Cross cultural research has illustrated how the ecological and socialization milieus are related to psychological differentiation. Higher differentiation is associated with hunting and gathering societies that have a "loose" social authority and encourage independence, self-reliance and achievement. Lower differentiation is associated with more sedentary societies characterized by "tight" social authority and emphasizing responsibility and obedience (Berry, 1971; Witkin & Berry, 1975).

Witkin and his associates have consistently stated that there are sex differences in the field articulation style favouring male subjects (e.g. Witkin, 1972; Witkin et al., 1962). There are a number of important exceptions to this trend, however. Massari and Massari (1973), and Mumbauer and Miller (1970) found no sex differences in embedded figures performance for their pre-school aged samples. With a sample of kindergarten children, Keogh and Ryan (1971) found no sex differences on the CEFT, but did find that boys were significantly superior on the portable rod and frame. There do not appear to be sex differences in field articulation for young, pre-school children. Cross cultural studies in the Canadian north have indicated no significant differences between Eskimo men and women on embedded figures tests (Berry, 1966; MacArthur, 1967). These results imply that no sex differences will be found in societies that do not encourage female dependency. The tendency of school-aged Euro-American females to be more field dependent than males might be a function of differences in socialization experiences (Witkin & Berry, 1975), sexual differences in spatial ability (Sherman, 1967), or an interaction of these two factors.

Factor analytic studies have shown that field articulation measures (for Euro-American subjects) load heavily on a "spatial—perceptual" factor of intellectual functioning (Goodenough & Karp, 1961). Witkin's tests typically are closely related to the WISC Object Assembly, Block Design, and Picture Completion subtests. Research by the Witkin group has shown that the field independence battery is not related to a "verbal comprehension" factor of the WISC, although this might be a function of studying relatively homogeneous groups (Vernon, 1972). A few studies have shown some relationships between field articulation and verbal ability. Crandall and Sinkeldam (1964), with a sample of twelve year old children, reported significant correlations for the EFT with WISC Information, Comprehension and Vocabulary subtests, WISC Verbal IQ, and WISC full scale IQ. Pedersen and Wender (1968) found that WISC verbal scores and CEFT scores were related. Correlations between the CEFT and the Peabody Picture Vocabulary Test were found only for the nine year old children in a sample studied by Bigelow (1971). Dubois and Cohen (1970) found that the EFT and the RFT were significantly related to a number of verbal aptitude measures for female university undergraduates. Stronger correlations with verbal aptitude were found for the EFT than for the RFT. These results, and the results of Keogh and Ryan's (1971) research, suggest that the field independence battery, particularly the EFT, is somewhat influenced by generalized intellectual ability.

The field articulation style dimension has been related to several other cognitive skills. Fleck (1972) found that field independent boys, as identified by the CEFT, were significantly more likely to be conservers on Piagetian conservation tasks than were field dependent boys. O'Bryan and MacArthur (1969) reported Vernon's Children's Hidden Figures Test to be significantly related to a Piagetian reversibility factor concerned with the operation of relations, but not related to a reversibility factor concerned with the operations of classes. Dickstein's (1968) research with female undergraduates found field independence to be related to concept attainment in a task that involved an array of complex perceptual stimuli. In all of these reports, field independent subjects were superior to field dependents in the assigned cognitive tasks which, it must be noted, were largely visuo-spatial in nature.

The relationships between field articulation and reading ability have been of interest to a number of researchers (Bruininks, 1969; Cohn, 1968; Erickson, 1974; Kaplan, 1969; Petersen & Magaro, 1969; Smith, 1973; Stuart, 1967; Watson, 1970; Wineman, 1971). In general, results have shown that articulated subjects are superior to global subjects on measures of reading ability. Kaplan has suggested that one of the most important factors shared by reading tasks and the embedded figures tests is selective attention. This is a plausible explanation for the superior reading performance of field articulated children.

Crandall and Sinkeldam (1964), Frehner (1973), and Perney (1971) all concluded that field independent children were better school achievers than their field dependent peers. This pattern of superiority for field independent subjects does not hold true at the university level, however. Witkin and Moore (1974) believe this is so because university students can select their courses of study to coincide with their personal style preferences. Elementary school children have no such choice and the typical curriculum is biased against those children who do not have an articulated approach.

Several authors have studied the relationship between field articulation and the impulsive-reflective style dimension developed by Kagan and his associates (Kagan et al., 1964). In all of these studies, field dependent children have tended to be impulsive, quick to make decisions with little or no generation or evaluation of alternative solutions. Field independent children were more reflective; they evaluated the quality of their judgements and came to decisions relatively slowly (Campbell & Douglas, 1971; Campbell, Douglas & Morgenstern, 1971; Keogh & Donlon, 1972; Mumbauer & Miller, 1970; Schleifer & Douglas, 1973; Smith, 1973). Embedded figures tests and the Matching Familiar Figures Test (used to assess impulsivity-reflection) have certain similarities, both requiring attentiveness, lack of distractibility, and an analytical perceptual ability. These characteristics, clearly, are highly valued in the school setting.

There is some research support for the theoretical prediction that field dependent children will exhibit more socially dependent behaviors than will field independent children. In free play situations, Crandall and Sinkeldam (1964) found that field dependent children were significantly more likely to seek affection from adults. Another study found attention seeking and physical contact to be negatively, but not significantly, related to CEFT scores for young children (Pedersen & Wender, 1968).

Using a number of experimental tasks, Ruble and Nakamura (1972) found that field dependent children tended to glance at the adult experimenter significantly more frequently than field independents. In addition, the glancing of field independent subjects was seen as primarily task-oriented and information seeking behavior, whereas the glancing of field dependent subjects was more socially oriented.

Konstadt and Forman (1965) found that field dependent subjects' performance on an experimental task was influenced by the experimental conditions of approval or disapproval statements. Field independent subjects were relatively less influenced. Results implied that field dependents were influenced by the social environment; field independents were influenced less by the social environment and more by the task demands.

After this brief review of field articulation research, the writer feels compelled, again, to caution against interpretation of personal styles along a 'good—bad' continuum. So often, in our ever more homogenized North American culture, we decry individual differences and/or rank them along a 'superior—inferior' scale. Unfortunately, this tendency may be most pronounced in the elementary school setting. As cross cultural research with Witkin's test battery has amply demonstrated, however, personal styles should be viewed as adaptive to particular ecological settings. Several examples of the adaptive usefulness of personal styles within our own culture have been identified. For example, field dependent persons tend to be better at learning and remembering social material, and prefer domains that feature interpersonal relations, such as teaching, sales work, and the social sciences. Field independent persons are better able to learn material that requires analysis, structuring, or restructuring. They often choose occupations that emphasize analytical skills such as engineering, technical trades, and the physical sciences (Witkin, 1972).

Relationship of Field Articulation to Locus of Control

The apparent similarity of the field articulation construct and the locus of control style has been noted by several writers (e.g. Lefcourt & Telegdi, 1971; Rotter, 1966). Investigations of the relationship between these two styles have produced inconsistent research results. This may be due, in part, to differences in the measures of personal style and sample characteristics of the various studies.

Crandall and Lacey (1972) reported significant relationships between the Intellectual Achievement Responsibility (IAR) locus of control questionnaire and ten figures from the Embedded Figures Test for a sample of six to twelve year old children. Age and IQ were found to be correlated with both the IAR scores and the EFT. When the influence of age and IQ was removed, significant correlations between the IAR and the EFT remained only for females in the group.

Stephens (1972) found that his measure of locus of control did not correlate significantly with the CEFT for preschool children. Glatt (1970) found that locus of control and level of differentiation were not related for eighth grade boys. The instruments that were used in the latter study were not specified.

Bonner's (1972) research with adult psychiatric patients indicated significant positive relationships between Rotter's I-E scale and the EFT. Results were interpreted as suggesting "considerable interrelation and overlap between the I-E scale and the EFT" (p. 2803).

Willoughby (1967) used the Hidden Figures Test (HFT) and the Adults' Locus of Evaluation and Control Scale (ALOE-C) to study the association of field articulation and locus of control with university students. He found the evaluation subscale of the ALOE-C (extent to which a person relies upon others for self-assessment) to be significantly related to number correct on the HFT. A control subscale (extent to which a person sees himself as being in control of environmental events) was not related to the Hidden Figures Test.

Deever (1967), Lefcourt and Telegdi (1971), McIntyre and Dreyer (1973), Roodin, Broughton and Vaught (1974), and Rotter (1966) have all reported no direct relationship between internal-external control and field articulation for adult subjects. Lefcourt has reported a "variable" relationship between Rotter's I-E scale and scores on the Block Design subtest of the Wechsler Adult Intelligence Scale, sometimes used as an indicator of field articulation (Lefcourt & Siegel, 1970).

Chance and Goldstein (1971) found that locus of control was related to improvement of EFT performance after a series of trials. This research was conducted with a sample of university students.

In summary, the descriptive similarities of the locus of control and field articulation styles have not been empirically demonstrated. Inconsistent research results invite further study of the relationship between these two apparently similar personal style constructs.

Style Differences Between Special Education Children and Regular Classroom Children

The study of individual differences in human functioning has particular relevance to the field of special education which must deal with the children who have not been able to meet the normal expectations of the schools. Of particular interest are those children without gross sensory impairments of learning such as the mildly retarded, the behaviorally handicapped and the learning disabled. A great deal of research has been conducted with mentally retarded children who can be relatively easily identified and categorized. The issue of categorization, however, is a heated one in special education today (e.g. Reynolds & Balow, 1972). Considerably less research has been done with behaviorally handicapped and learning disabled children who represent a less easily defined and, in the case of learning disabilities, only recently 'discovered' group of children.

Much psychological research involving exceptional children has taken the form of comparison between a special education group and a "normal" group on some dimension. Rotter and Witkin's personal style measures (and functionally similar descriptors of behavior) have been used to explore differences between special and regular education groups.

Research has repeatedly shown that mentally retarded children are more outer-directed in their orientations to the environment than either their chronological or their mental age peers (Bialer, 1961; Cromwell, 1963; MacMillan, 1971; Turnure & Zigler, 1964; Zigler, 1966). These authors have described a developmental shift in motivation orientation from outer- to inner-directedness that is a function of increasing cognitive development (MA), withdrawal of external cues (i.e. independence training), and a history of success. Because the retarded child has a lower MA, is usually closely supervised by adult caretakers, and frequently has a history of failure, he tends to be more dependent and susceptible to the influence of others than is the non-retarded child.

Based on data from a number of projective tests, a group of learning disabled children were found to be less "autocritical" than a group of normal children (Connolly, 1969):

> He frequently does not accept blame or responsibility for his actions. The dyslexic is thus, perhaps, less willing to see himself as a causal factor in his academic difficulties [p. 127].

Fox (1972) and Tognetti (1972), using a subscale of the IAR locus of control questionnaire, found that groups of retarded, and learning disabled children, respectively, were less willing to accept responsibility for academic failures than were normal children. Total IAR scores, also, showed the special education groups to be significantly more external than normal classroom counterparts.

Kronick (1976) discussed the implications of the labelling process [illegible] the learning disabled child's control beliefs. When the child's perceptions of his own normalcy are destroyed by the labelling and placement process, "then about the best he can do is to show that he is not responsible for what has become of him" (p. 117).

At odds with the trend of the research reported above are the results of experimental studies by Chan and Keogh (1974) and MacMillan (1969). Using an interrupted task paradigm, both studies found retarded subjects to be more self-blaming than non-retarded peers. In Chan and Keogh's research, the retarded children's verbal self-blame was paralleled by high I- scores (responsibility for failures) and low I+ scores (responsibility for successes) on the IAR locus of control scale. The opposite pattern was shown by the normal children who did not tend to blame themselves for incompleted tasks, and had significantly higher I+ and lower I- scores. Total IAR scores showed no difference between the two groups. The data were interpreted as suggesting an "expectancy for failure" trait in many retarded children (see Zigler, 1966).

This expectancy for failure, presumably, could be expressed in two very different ways. The child who has experienced a history of failure might reject responsibility for his failures and perceive himself as a pawn of unjust and uncontrollable events. On the other hand, the child might blame himself for his failures and, in effect, perceive himself as being in control of environmental events. These two possibilities are reflected in the contradictory research results that have been obtained. The most widely held view is that special education children, who by definition have had histories of school failure, will be more external in their control beliefs (Lawrence & Winschel, 1975).

Typical descriptions of the learning disabled child often include such terms as "hyperactive," "distractible," and "impulsive" (McCarthy & McCarthy, 1969). In a review of attention deficits in learning disabled children, Tarver and Hallahan (1974) found that these children are more distractible when distractibility is defined as the "inability to filter out extraneous stimuli and focus selectively on the task" (p. 567).

> The evidence strongly indicates that these children are not more highly distracted by flashing lights or extraneous colour cues, but they do seem to be deficient in ability to focus their attention on other types of tasks involving embeddedness [p. 564].

Tarver and Hallahan's review suggests that the attentional deficits of many special education children will be reflected in lower scores on measures of field independence than regular classroom children.

One of the defining characteristics of the brain injured children studied by Strauss (Strauss & Lehtinen, 1947) was a tendency to make figure-ground distortions. Present day conceptions of the learning disabled child are largely based on the pioneer efforts of Strauss. Figure-ground perception is clearly involved in the perceptual tasks of Witkin's field articulation battery.

The field articulation measures have been explicitly used in several research investigations involving exceptional children. As part of an extensive research project involving hyperactive children, Douglas (1972) has found that performance on embedded figures tests is different for groups of normal and hyperactive children. Campbell, Douglas and Morgenstern (1971) reported that hyperactive children had lower CEFT scores than comparable non-hyperactive children. Hyperactive adolescents took significantly more time on the EFT than their normal peers but the number of correctly identified figures showed no significant difference (Cohen, Weiss & Minde, 1972). Results from a number of studies by the Douglas group have suggested that an underlying dimension tapping "attention, impulse control, and the ability to take an analytic approach to problems" may differentiate hyperactive from normally active children (Douglas, 1972, p. 275). This "stop, look, and listen" dimension has implications for both cognitive and social behavior. Because many children in special education classrooms are described as hyperactive, the research of Douglas and her coworkers predicts that special education students, as a group, will be more field dependent than children in regular classrooms.

Results from studies by Keogh and Donlon (1972) and Petersen and Magaro (1969) showed that children in learning disability classrooms were more field dependent than children not receiving special educational assistance. The measures of field articulation in these two projects were a portable, adapted version of the rod and frame test and the EFT, respectively.

Nesbit's (1973) research indicated that young familial retarded children were significantly more field dependent than non-retarded children, matched for mental age. The CEFT and a portable rod and frame were the instruments used in the Nesbit study.

Although retarded children tend to be more field dependent than children of normal intelligence, examination of the WISC profiles of retarded children has shown relative superiority of the analytic factor, commonly associated with field articulation (Keogh, Wetter, McGinty & Donlon, 1973; Witkin, Faterson, Goodenough & Birnbaum, 1966). The overall pattern for the retarded children indicated low verbal scores (Information, Comprehension, Similarities, and Vocabulary subtests), low "attention-concentration" scores (Arithmetic, and Digit Span subtests), and relatively higher analytic scores (Block Design, Object Assembly, and Picture Completion subtests). The authors suggested that a heavy emphasis on verbal ability in the schools and in test construction leads to a bias in classifying children as mentally retarded. Some children labelled retarded may actually be quite competent in certain cognitive domains. Other children with adequate verbal skills, but below average analytic abilities, may escape the "retardation filter."

Summary

This chapter has reviewed the literature pertinent to the research questions that have guided this investigation. The nature of the locus of control and field articulation personal styles were discussed. These parallel descriptions will be brought together in the following chapter to illustrate the theoretical similarities of the two styles.

The literature review also covered previous empirical investigations of the relationships between the locus of control and field articulation styles. The inconclusive nature of this research provides some impetus for the present study of the association of these two style constructs.

Also discussed in the review of the literature were research studies describing differences between regular classroom and special education children on the dimensions of internal-external control beliefs, and articulated-global functioning. These previous studies are directly relevant to the present investigation of differences between regular classroom and special education children on measures of the two personal styles.

Chapter III

DEFINITIONS, RATIONALE, AND HYPOTHESES

Definitions

Personal Style: a person's typical mode of perceiving, thinking, and behaving in various situations. "Personal style" subsumes the more specific terms of "perceptual style," "cognitive style," and "personality trait."

Locus of Control: a personal style which describes a continuum of belief about the source of personal reinforcements. *Internal* locus of control refers to an expectancy that reinforcement is contingent upon one's actions. *External* locus of control refers to an expectancy that reinforcement is unrelated to one's actions, hence beyond personal control.

Field Independence-Dependence: the perceptual component of a broader field articulation personal style. *Field independence* describes the perceptual ability to overcome the influence of a surrounding field and separate an item from its context. *Field dependence* describes the relative inability to isolate an item from its perceptual field.

Field Articulation: a personal style which describes a tendency toward an articulated or global mode of experience. Originally derived from the field independence-dependence perceptual style, the field articulation style encompasses perceptual, intellectual, emotional, social and motivational behaviors. The *articulated* person typically displays field independent perceptual behavior, analytical intellectual behavior, controlled emotional behavior, self-reliant social behavior and active motivational behavior. The *global* person tends to be more field dependent, intuitive, impulsive, and other-directed.

Special Education Group: that portion of the present research sample consisting of boys enrolled in the Edmonton Public School Board's adaptation classrooms for learning disability children. Criteria for placement in *adaptation classes* include (1) an average general IQ; (2) an inability to function in the regular class with or without resource room assistance; (3) generally two years behind in academic functioning. *Learning disability* is defined by the Alberta Department of Education (1973) as:

> . . . an inability to function in academic school work at a level commensurate with intellectual potential as measured by an individual intelligence test which has a non-verbal component. The disability could be one or more of emotional, social, neurological or perceptual disorders not associated with an identifiable sensory handicap and with no evidence of mental retardation.

Regular Class Group: that portion of the present research sample consisting of boys enrolled in regular classrooms. These boys have not failed any grades, and have no history of special education placement.

Research Rationale and Hypotheses

Using two tests for each of two hypothesized traits is a first step in a multitrait-multimethod approach to construct validation (Campbell & Fiske, 1959). If two methods of measuring a construct are correlated, and not correlated with tests of another similar trait, then the distinctiveness of each trait (in this case, field articulation and locus of control) is supported.

Convergent validation of the measures of a certain trait is demonstrated by substantial relationship between two or more measures of the same trait. Witkin et al. (1962) have suggested that field independence should be measured by a battery of (1) the Embedded Figures Test, (2) the Rod and Frame Test, and (3) the Body Adjustment Test. Any one of these tests in isolation may be inadequate as a test of differentiation. Some authors have argued, for example, that the Embedded Figures Test, in itself, is simply an indication of spatial-visualization ability (Horn, in press; Sherman, 1967). The field independence measures used in the present study were the Children's Embedded Figures Test (CEFT), and the Portable Rod and Frame Test (PRFT), both adapted versions of Witkin's original instruments (Karp & Konstadt, 1963; Oltman, 1968). The extent of the correlations between the CEFT and the PRFT will give some indication of the usefulness of the differentiation hypothesis as a broad explanatory construct.

The two measures of locus of control used in this study were the Intellectual Achievement Responsibility (IAR) questionnaire, and the Nowicki-Strickland Locus of Control Scale for Children (NSLCSC) (Crandall et al., 1965; Nowicki & Strickland, 1973). The two questionnaires being used appear to measure different aspects of internal-external control. The IAR examines locus of control in an intellectual-academic area, whereas the Nowicki-Strickland scale looks at the control orientation in a more general context. The magnitude of the correlations between the two tests will give an indication of the usefulness of a generalized locus of control construct.

Hypothesis 1

(a) The Intellectual Achievement Responsibility (IAR) scale will be significantly related to the Nowicki-Strickland

Locus of Control Scale for Children (NSLCSC) for special education boys.

(b) The IAR scale will be significantly related to the NSLCSC for regular classroom boys.

(c) The IAR scale will be significantly related to the NSLCSC for the total sample.

Hypothesis 2

(a) The Children's Embedded Figures Test (CEFT) will be significantly related to the Portable Rod and Frame Test (PRFT) for special education boys.

(b) The CEFT will be significantly related to the PRFT for regular classroom boys.

(c) The CEFT will be significantly related to the PRFT for the total sample.

Field independence tests, in large part, are measures of cognitive and perceptual *ability*, alhtough Witkin has argued that field independence is an indicator of a generalized level of psychological differentiation. Locus of control is more an indication of one's *beliefs* and *expectancies*. However, both the abilities and the beliefs are closely associated with a number of similar behaviors.

Both style constructs show a developmental progression from behaviors that might be characterized as passive, conforming, and dependent, to behaviors that reflect greater independence and active involvement. The internal and the field independent person typically exhibit more articulated or analytic cognitive ability than the external and field dependent individual. The emotional behaviors of the internal and field independent person are similar: both are characterized by high self-esteem and controlled emotional response. The external and field dependent person tends to have lower self-esteem and exhibits more impulsive emotional behavior.

The influence of parents' behaviors and their philosophy of child rearing have a similar effect on both style orientations. Parents who are warm, supportive, and who encourage independence, tend to have children who are internal and field articulated.

Research indicates that the two individual styles are closely related to measures of school achievement, and behaviors defined as task- or achievement-related. The articulated and internal person is seen as the most successful in the school setting. On the other hand, the global and external person is usually more successful in those settings that stress interpersonal interaction and social awareness.

The theoretical similarity of field articulation and locus of control is revealed in the following discussion of identity and psychological differentiation:

> With respect to relation with the surrounding field, a high level of differentiation implies clear separation of what is identified as belonging to the self and what is identified as external to the self. The self is experienced as having definite limits or boundaries. Segregation of the self helps make possible greater determination of functioning from within, as opposed to a more or less enforced reliance on external nurturance and support for maintenance, typical of the relatively undifferentiated state [Witkin et al., 1962, p. 10].

Rotter (1966) noted some similarities of his style construct with that of Witkin, but reported insignificant correlations between his I-E scale and the Gottschalk Figures Test, a predecessor of Witkin's EFT.

Empirical investigation of the relationship between locus of control and field articulation has produced equivocal research results. The bulk of this research has been conducted with adult subjects.

The theoretical similarity of the locus of control and field articulation style constructs suggests possible correlations between the two styles. If these predicted correlations are found, then the distinctiveness of the individual traits becomes questionable. Discriminant validity of the measures of personal style can be demonstrated by low, insignificant relationships between the two styles.

A sample of elementary school boys was selected for study because the personal style approach is seen as potentially most useful in the school setting. The total sample was comprised of a group of special education (learning disabled) boys and a group of regular classroom boys who, for reasons to be discussed, were hypothesized to be situated towards opposing ends of the internal-external and analytic-global continua. In this way, the relationship of the two personal styles could be explored both for a group of presumably external and global boys, and a group of boys hypothesized to be more internal and analytic in their style orientations.

Hypothesis 3

> Locus of control scores (IAR, NSLCSC) will be positively related to field independence scores (CEFT, PRFT) but at a lower level of significance than within trait correlations.

Considerable research evidence points to the fact that mentally retarded children are more dependent and outer-directed than normal children. Assuming a functional similarity of many behaviors and experiences of the retarded child and the learning disabled child (Neisworth & Greer, 1975), it is suggested that learning disabled children will also be more outer-directed than children in regular classrooms. The early experiences of many exceptional children might be expected to contribute to the development of a global and external individual style:

> It seems likely that many exceptional children have less stimulation, a narrower range of experiences, and are maintained in dependent interpersonal relationships for longer periods of time than normal children. Effects of restricted problem-solving experiences and tolerance of less adaptive behaviours may influence development and maintenance of particular perceptual or cognitive modes; specifically, they may contribute to modes which are less adaptive in terms of later performance in an achievement-motivated society [Keogh, 1973, p. 98].

The learning immaturity of the learning disabled child is commonly ascribed to a developmental or maturational lag (Lerner, 1971). This theory assumes that the learning problems of many non-physically handicapped children are due to a lag in the maturation of certain skills and abilities rather than actual neurological damage. Because both field independence and locus of control are developmental functions, it seems reasonable to suggest that those learning disabled children who are developmentally delayed will tend to score at the field dependent and external ends of these personal style continua.

Stephens (1971) has argued that the various cognitive correlates of an internal locus of control (e.g. reflectivity, greater attention deployment, better use of relevant task dimensions) may mediate intellectual development.

> Each of these variables ought to affect not only the child's performance, but also his rate of *acquisition* of successful problem solving strategies, of schemata, and of various cognitive contents, processes, and

> skills which indeed would be considered aspects of "intelligence" *per se*. The internal child, that is, may more rapidly learn how to be intelligent [p. 2].

No cause or effect relationship is presumed between 'intelligence' and personal styles. However, a two-way relationship might be hypothesized. For example, the internal child may tend to be more motivated towards individual inquiry and investigation. This leads to a betterment of cognitive contents and processes which, in turn, tends to produce a stronger belief in one's control of the environment. If this reasoning is accepted, then the learning disabled child, who has not developed the cognitive and/or behavioral skills to adapt to the regular classroom, might be presumed to be at the external end of the locus of control scale.

Field independence is presumably only associated with that type of cognitive behavior that requires disembedding elements from a visuo-spatial context (Witkin et al., 1971). However, the behavioral components of psychological differentiation might be involved in a similar two-way relationship with general intelligence as locus of control is hypothesized to be.

Several authors have indicated that special education placement, in itself, may contribute to a more external and global style of functioning. According to Lawrence and Winschel (1975), special educators have created environments in which "children are mollycoddled and praise is unrelated to accomplishment, neither of which is conducive to the self-reliance educators seek to promote" (p. 485). Solomon and Oberlander (1974) have suggested that an overly sensitive teacher who responds to a child's needs before they are articulated may inhibit the development of that child's belief in his control of reinforcements. Frequently, then, the special education class may perpetuate the child's dependency behaviors and beliefs that the consequences of his behavior are not under his control.

Research data, in general, has tended to support the theoretical prediction that special education children will be more external and field dependent than regular classroom children.

Hypothesis 4

> Children in special education classes for the learning disabled will be more external, as measured by the IAR and the NSLCSC, than children in regular classes.

Hypothesis 5

> Children in special education classes for the learning disabled will be more field dependent, as measured by the CEFT and the PRFT, than children in regular classes.

The nature of sex differences in the locus of control and field articulation style dimensions has not been clearly identified in research to date. The sex of the subject might have a confounding effect on the data obtained for this study. To avoid this possibly confounding influence, only male students were selected for the sample in the present study.

Witkin et al. (1971) have argued that "one cannot say that persons who are field independent on the EFT are superior in *general* intelligence, as reflected in the Wechsler, since they may show wide variations in the other two IQ factors" (p. 7). Other authors (e.g. Zigler, 1963a,b) have suggested that a great deal of the variance on the field articulation measures can be attributed to a general intellectual factor. Corah (1965) has argued that measures of verbal intelligence should be included in any research of the differentiation hypothesis. In the present study it was decided, therefore, to include verbal measures of general intelligence because of the possible associations of the field articulation style with general intellectual capacities.

There has been some indication that the locus of control style is also related to general intelligence. At any rate, the *measures* of locus of control beliefs clearly involve verbal comprehension ability. Consequently, it is important to observe the relationships between verbal intelligence and the internal-external control style.

No significant differences in general intelligence scores were expected between the special education and the regular class groups. The children placed in special education adaptation classes for the "learning disabled" are considered to be of normal intelligence. Slight differences might be expected because surveys of learning disability classes have found a larger proportion of below average IQ's than is found in the general population (Kirk & Elkins, 1975).

Socio-economic status (SES) has been tentatively linked to the two personal styles under consideration. It was considered important to measure the effects of SES on the locus of control and field articulation styles. An index of SES was included in the test battery of the present study. No SES differences were expected between the special education and regular class groups.

Chapter VI

METHOD

Selection of Sample

The subjects for this research were 71 boys from six schools in the city of Edmonton, Alberta. The selected schools were situated in neighbourhoods judged to be of neither very high nor very low socio-economic status. This criteria was considered a rudimentary step in minimizing the influence of socio-economic status on the research results. Five of the six schools housed two adaptation classes. These schools were selected for the practical reason of facilitating data collection.

The total sample was made up of a group of boys in special education classes for the learning disabled, and a group of boys in regular classes. Every attempt was made to select equal numbers of boys from adaptation and regular classes in each school. Conditions prevented perfect one-to-one matching in three of the six schools.

Special Education Sample

The members of the special education group were selected according to the following criteria:

1) are male;
2) are placed in an adaptation (learning disability) classroom for all academic subjects;
3) have a reported general IQ score of between 85 and 115 according to school records;

4) have been born between June 1964 and June 1966. Chronological age at time of testing was between 9 years 6 months and 11 years 9 months.

All children in the six schools who fit the preceding criteria were included in the study. One boy moved away from the school area before testing could be completed so was dropped from the sample. Final sample size for the special education group was 35.

All of the boys in the special education group were Caucasian except for one Negro boy and two boys of Canadian Indian descent.

Regular Class Sample

The members of the regular class group were selected to meet the following criteria:

1) are male;
2) are in a full time regular classroom with no history of special education placement;
3) have a reported general IQ score of between 85 and 115 according to school records;
4) are presently in grade 5, and have not repeated any grades. Chronological age at time of testing was between 10 years and 11 years 6 months.

The required number of regular class children in each school were selected from alphabetical class lists. There were no dropouts from the sample originally selected. Final sample size for the regular class group was 36.

The majority of the regular class sample was Caucasian. One boy was Lebanese and two other boys were Canadian Indians.

Descriptive characteristics of the two sample groups can be found in Table 1.

Selected Measures

Intellectual Achievement Responsibility (IAR) Questionnaire

Early investigations of the locus of control construct focused exclusively on the reinforcement-responsibility beliefs of adults. Increasing interest in children's locus of control beliefs led to the development of new measures of the control construct with content and instructions that were comprehensible to the young child. One of the most frequently used measures of children's locus of control is the Intellectual Achievement Responsibility (IAR) scale developed by Crandall, Katkovsky and Crandall (1965) as part of a larger project dealing with children's achievement development.

The IAR differs from many other measures of internal-external control by focusing only on the child's perceived locus of control in intellectual-academic functioning. The authors of the IAR believe that perceived control of reinforcement is not necessarily generalizable across different life situations.

The IAR also differs from many other locus of control questionnaires in the range of external forces that are described. The IAR limits the source of external control to people in the environment, such as parents, teachers, and peers. It does not include impersonal social forces, luck, or fate. Two reasons were cited for the restriction of external environmental forces described. First, the generality of children's control beliefs across personal and impersonal forces has

TABLE 1

DESCRIPTIVE DATA FOR SPECIAL EDUCATION AND REGULAR CLASS GROUPS

Variable	Special Education Group			Regular Class Group		
	$\bar{X}$	s	Range	$\bar{X}$	s	Range
AGE (months)	127.57	7.62	115-141	127.17	4.52	120-138
SES (Blishen)	37.31	9.74	28.22-74.27	41.83	10.18	29.18-74.27
INFORMATION (WISC)	7.54	1.99	3-11	10.64	2.87	6-17
VOCABULARY (WISC)	8.57	2.08	6-14	10.72	2.37	4-15
MEAN WISC VERBAL SCORE	8.06	1.71	4.5-12.5	10.68	2.40	5-16

not yet been established. A second reason is that the interpersonal aspect of external control beliefs is closely associated with the child's important developmental task of resolving a dependence on adult caretakers.

The questionnaire consists of 34 forced choice questions that describe an equal number of positive and negative achievement experiences (see Appendix A). Three scores are obtained. The "I+" score measures belief in internal responsibility for successes, and the "I-" score reflects belief in internal responsibility for failures. The "I" score, obtained by summing the I+ and I- scores, is a total score of internality, or self-responsibility.

Test-retest reliability coefficients for the I, I+, and I- scores were reported by Crandall et al. (1965) as .69, .66, and .74 respectively. For a sample of children in grades 3, 4, and 5, the split-half reliability (Spearman-Brown correction) for the I+ and I- scores was .54 and .57.

For pre-adolescent children, correlations between the I+ and I- scores were low and insignificant which the authors concede may be due, in part, to the moderate reliabilities of the scales. However, it was also suggested that the two scales were measuring different aspects of locus of control.

Crandall et al. (1965) reported no significant increases for any of the IAR scores from grades 3 to 5, and from grades 6 to 12. There was some indication that girls' IAR scores were higher than boys' after the sixth grade.

Standardization data showed low but significant relationships between IQ and IAR scores for children in grades 3, 4, and 5.

Total I scores were consistently related to standardized achievement tests and report card grade averages for the younger children. Some interesting sex differences were apparent however. Measures of achievement for girls were related to I+ scores representing responsibility for academic successes. On the other hand, boys' achievement scores were associated with I-scores of responsibility for academic failures.

Relationships between IAR scales and social class status reached significance only for the I+ subscale.

Nowicki-Strickland Locus of Control Scale for Children (NSLCSC)

The Nowicki-Strickland Locus of Control Scale was developed in response to the perceived need for a "reliable, methodologically precise measure of generalized locus of control of reinforcement that could be group administered to a wide range of children" (Nowicki & Strickland, 1973, p. 149). The Nowicki-Strickland scale differs from the IAR by being a measure of generalized locus of control. The NSLCSC questions tap the child's locus of control beliefs across a variety of life situations and with a variety of external control agents.

The questionnaire consists of 40 questions that are answered "yes" or "no" by the respondents (see Appendix B). The scale is designed to provide one total score which is scored in an external direction. In order to maintain consistency with IAR scores, however, the Nowicki-Strickland questionnaire was scored in an internal direction for this study. Thus, for both scales, a high score implies an internal locus of control and a low score implies an external belief style.

Test-retest reliabilities for grades 3, 7, and 10 were .63, .66, and .71, respectively. Split-half reliabilities (Spearman-Brown correction) ranged from .63 for grades 3, 4, and 5, to .81 for grade 12.

Cross-sectional data clearly showed that NSLCSC scores were related to age. Older students' responses tended to be more internal than those of younger students. At all ages, girls tended to be slightly more internal than boys, although no statistical tests of the significance of the sex differences were reported by the NSLCSC authors.

Correlations between NSLCSC scores and achievement test scores were all in the predicted direction, but reached significance only for the male group. Internal males were more likely to be high school achievers than were external males.

Nowicki-Strickland scores were largely unrelated to social class standing. There was some tendency for internal scores to be associated with higher occupational level.

Nowicki and Strickland compared IAR scores and NSLCSC scores for a sample of black third and seventh grade children. For both groups, the Nowicki-Strickland scores were significantly related to I+ scores, but not to the I- scores.

Children's Embedded Figures Test (CEFT)

The most commonly used measure of Witkin's field articulation style has been the Embedded Figures Test (EFT). This test requires a subject to perceive a simple form within a complex geometric background. The EFT has proven to be too difficult for most children below the age of nine.

An early adaptation of the EFT for children was designed by Goodenough and Eagle (1963), but it proved to be too cumbersome for practical use. A further revision of the EFT by Karp and Konstadt (1963) is the Children's Embedded Figures Test (CEFT) which is now widely used as a measure of field dependence for children between the ages of 5 and 12.

The CEFT consists of 25 items in which the child must find a simple form hidden within a meaningful picture card (see Appendix C). In the first part of the test, a triangular "tent" form has been embedded within the pictures. A more complex "house" form must be discovered in the second part of the test. One point is scored for each correctly identified figure for a maximum possible score of 25. The test manual (Witkin et al., 1971) is somewhat ambiguous about the criteria for correct identification. For this study, subjects were required to outline the figure with their finger, rather than simply pointing to the figure. For several items, notably H2, H11, and H14, children frequently were able to point to the embedded figure but were unable to precisely outline the figure. No scoring credit is given for speed of response, although the individual differences in the time for figure recognition is notable.

Witkin et al. (1971) reported internal consistency reliability coefficients ranging from .83 to .90 for different age levels. Test-retest reliability for a middle class 5 and 6 year old group has been reported as .87 (Dreyer, Nebelkopf & Dreyer, 1969). A lower test-retest reliability of .80 was reported by Bowd (1974) for a sample of working class kindergarten children.

Validity coefficients (correlations between the CEFT and the EFT) ranged from .70 to .86 for nine to twelve year old boys. In addition, the pattern of correlations for the CEFT and other measures of differentiation has been very similar to that for EFT scores, suggesting that the CEFT is a valid alternative to the more difficult EFT for young children.

Performance on the CEFT was significantly related to age, older children being more field independent than younger children. The effect of sex on CEFT scores was not significant.

There has been some suggestion (Witkin et al., 1971) that CEFT performance is related to social class standing. Scores of lower class children have tended to be lower than those for children from more advantaged homes.

Portable Rod and Frame Test (PRFT)

The Rod and Frame Test (RFT) used in Witkin's original research required a completely darkened room. Inside the room, a luminous rod was suspended within a luminous square frame. The subject was required to bring the rod to a vertical position despite the distracting background of a tilted frame.

The original RFT was an impractical testing device for several reasons. The need for a completely darkened room often precluded the use of the RFT in natural field situations. The darkened room also presented the possibility of being an anxiety-provoking situation for certain test subjects. Several adapted RFT apparatuses have been developed in response to the need for a portable RFT that does not require a darkened room. The Portable Rod and Frame Test (PRFT), used in the present study, was developed by Oltman (1968), one of Witkin's research associates.

The PRFT apparatus consists of a rectangular enclosure which serves as the frame and can be tilted 28° to the left or right. At one end of the enclosure is a headrest; at the other is a black rod which can be tilted from the vertical. The inside of the enclosure opposite the headrest is edged in black to provide the background frame which is tilted from the vertical. A plastic frame around the headrest restricts the subject's field of vision to the inside of the enclosure. A curtain is raised in front of the subject's face between trials, to block his view of the interior of the enclosure (Fig. 2 shows a model of the PRFT apparatus).

For each test trial, the frame is tilted 28° to left or right. The rod is also tilted 28° from the vertical in either the same or the opposite direction of the frame. The tester moves the rod following the instructions of the subject until the rod is perceived to be in a vertical position. The score for the PRFT is the sum of the absolute deviations from the vertical in degrees over eight trials. In order to be consistent with CEFT scores, scores on the PRFT were transformed so that a high score implied field independence and a lower score implied field dependence. This was done by subtracting raw PRFT scores from 224 (8 x 28) — the highest possible deviation from the vertical over eight trials.

In the standardization study, split half reliabilities (Spearman-Brown correction) were reported as .95 (Oltman, 1968). Dreyer, Dreyer, and Nebelkopf (1971) reported test-retest reliability after one month to be .96 for middle class kindergarten children.

Correlations between the PRFT and the standard version of the RFT were .89 for females and .90 for males. The relationship between the

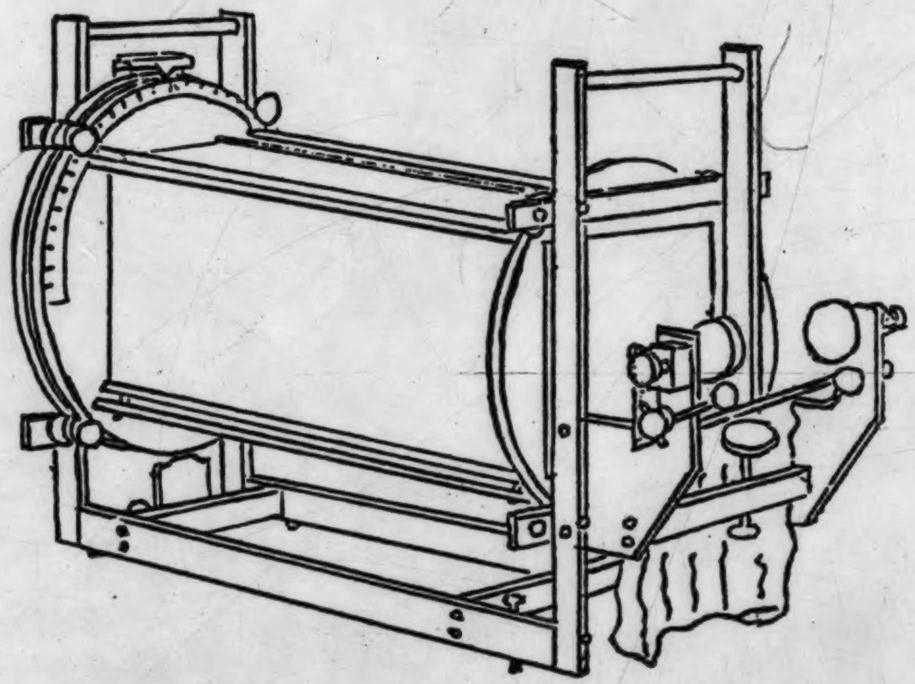

Figure 2. Portable Rod and Frame Apparatus, Model V-1260-A. (Reprinted from *Operating Instructions for Vertical Rod and Frame, Portable*, 1968).

two types of rod and frame test and the EFT were essentially the same (PRFT and EFT, r = .60; RFT and EFT, r = .56). These results are strong indications that the PRFT is a valid alternative to the standard Rod and Frame Test.

With five to seven year old children, there has been some evidence to suggest that the performance of boys was superior to girls' on the PRFT (Dreyer et al., 1971; Keogh & Ryan, 1971). No significant sex differences were reported for a sample of university undergraduate students (Oltman, 1968).

Vocabulary and Information Subtests (Wechsler Intelligence Scale for Children — WISC)

The Wechsler Intelligence Scale for Children (WISC) is one of the most widely used individual tests of intelligence. The Vocabulary and Information subtests of the WISC can be viewed as measures of either general or verbal intellectual ability.

According to Cohen's (1959) factor analysis of the WISC, the Vocabulary and Information subtests are the two best indicators of "g", or general intelligence. Cohen also found that these two subtests were key indicators of a verbal comprehension factor that "seems to reflect that aspect of verbally retained knowledge impressed by formal education" (p. 286).

A substantial part of the variance for the Vocabulary subtest is occupied by a "g" factor. Cohen concluded that "these values are quite high, and justify the frequent practice of using this subtest by itself as a basis of estimating intelligence in research and clinical screening batteries" (p. 294). Vocabulary and Information are one of only four subtest duos at the 10½ year old level that have a correlation of at least .90 with full scale IQ scores (Glasser & Zimmerman, 1967, p. 128). A correlation of .90 with full scale IQ is considered the minimum acceptable level for brief form tests of intelligence.

In this study, the Vocabulary and Information subtests were used as indicators of general and verbal intelligence. Practical research considerations precluded use of the complete WISC test, but it was believed that these two subtests, in combination, were valid indicators of verbal intellectual ability. An individually administered assessment of intelligence, such as these two subtests, was selected in order to avoid the need for reading ability. Unrealistically low estimates of the intellectual ability of many of the learning disabled boys may have resulted from the use of an assessment device that required reading competency.

Raw scores for the Vocabulary and Information subtests were converted to scaled scores according to the norms of the WISC manual (Wechsler, 1974). These scores have a mean of 10 and a standard deviation of 3. A mean verbal intellectual ability score was obtained by averaging the scaled scores for the two subtests.

Split-half reliabilities (Spearman-Brown correction) for 10½ year old children were listed as .84 and .83 for the Vocabulary and Information subtests (Wechsler, 1974). Vocabulary and Information had .85 and .86 test-retest reliability coefficients, respectively, for a group of 10½-11½ year old children.

Blishen Socio-Economic Index

One of the few Canadian measures of socio-economic status is the Blishen Socio-Economic Index (Blishen, 1967). The Blishen index was constructed from information in the 1961 Canadian census, and is a rank ordering of 320 occupations according to their social status. Each occupation is assigned a socio-economic index score based on the income and education of the incumbents of each occupation. The socio-economic index score for a family is based on the highest ranking parental occupation.

Procedures

The data for this research study were collected during the months of January and February 1976. All testing took place in the schools at times convenient for the cooperating teachers.

Each child was involved in three testing sessions. During the first session of approximately 40 minutes, a small group of 2-6 classmates were given a general outline of the testing procedures, and the two locus of control questionnaires were administered. The examiner read the instructions and questionnaire items for all subjects in order to minimize the effects of different reading abilities. The questionnaires were presented in counterbalanced order to different groups of students.

Each boy was seen individually on a second occasion at which time the WISC subtests and the CEFT were administered. These sessions ranged from 25 to 40 minutes depending on the individual student. The same order of testing, namely Information, Vocabulary, and CEFT, was maintained for all subjects. Two reasons are suggested for this order. First, the Information subtest is described in the Wechsler manual as a good 'icebreaking' test. Secondly, the CEFT involves more of a "game" atmosphere and was seen as a good test for ending the session on a positive note.

In a final individual session, the PRFT was administered and information regarding subject's date of birth and parental occupations was solicited.

In fourteen cases, the descriptions of parental occupation were not sufficiently precise to permit assignment of a Blishen socio-economic index score. These boys were assigned Blishen scores corresponding to the average index score of their fellow school-mates.

Chapter V

RESULTS

Despite attempts to equate the special education and regular class groups on descriptive variables of age, socio-economic status, and WISC verbal intellectual ability, some inter-group differences were apparent. In Table 2 are reported the t-test comparisons of the descriptive variables for the two groups. For each comparison, non-directional tests of significance were used.

The ages of the two groups did not differ significantly; the average age for both groups was 127 months (10 years 7 months). The regular class group tended to be of somewhat higher socio-economic status compared to the special education boys, although differences did not reach the .05 level of significance. On the whole, both groups might be characterized as being from lower-middle socio-economic status homes.

Differences between the two groups on the Information, Vocabulary and Mean WISC Verbal Scores were all strongly significant ($p<.001$). WISC subtest scores for the special education group were clearly inferior to those for their regular classroom counterparts.

Hypothesis 1

Before analyzing the personal style data, all raw scores were converted to T scores so that analysis might be conducted on a common basis. All further *correlational* analysis is based on standardized scores.

To investigate the convergent validity of the locus of control measures, Pearson product-moment correlations were computed for the three IAR scores and the Nowicki-Strickland scores. Separate analyses

TABLE 2

t-TEST COMPARISONS OF SPECIAL EDUCATION AND REGULAR CLASS GROUPS FOR DESCRIPTIVE VARIABLES OF AGE, SES, AND VERBAL INTELLECTUAL ABILITIES

Variable	Special Education Group $\bar{X}(s)$	Regular Class Group $\bar{X}(s)$	t	p
AGE (months)	127.57(7.62)	127.17(4.52)	.27	$p>.75$
SES (Blishen)	37.31(9.74)	41.83(10.18)	1.92	$p>.05$
INFORMATION (WISC)	7.54(1.99)	10.64(2.87)	5.29	$p<.00001$
VOCABULARY (WISC)	8.57(2.08)	10.72(2.37)	4.07	$p<.001$
MEAN WISC VERBAL SCORE	8.06(1.71)	10.68(2.40)	5.31	$p<.00001$

were conducted for the special education group, the regular class group and the total sample.

Preliminary examination of locus of control correlations strongly indicated the independence of the IAR+ and IAR- subscales of the IAR locus of control questionnaire. The total IAR score, therefore, was not seen as a very useful or informative score in this research and was dropped from further consideration.

For the special education group (Table 3), the IAR+ and IAR- scores, as mentioned, were not related. The IAR subscores were more closely associated with Nowicki-Strickland (NSLCSC) scores. The correlations between the IAR+ and the NSLCSC did not reach significance, but the correlation between IAR- and NSLCSC was significant at the .01 level.

Locus of control intercorrelations for the regular class group (Table 4), in all cases, were low and insignificant.

The larger N of the total sample permitted the IAR- and NSLCSC correlation to reach significance at the .05 level. Correlations between the IAR+ and the IAR-, and between the IAR+ and the NSLCSC, shown in Table 5, were not significant.

Hypothesis 2

The convergent validity of the field articulation measures was investigated by observing the extent of the correlations between the CEFT and the PRFT tests. Results reported in Table 6 showed consistent moderate relationships between the two variables. The correlation, in each case, was significant at the .01 level.

Hypothesis 3

From a theoretical point of view, hypothesis 3 was investigating

TABLE 3

SPECIAL EDUCATION GROUP

PRODUCT-MOMENT CORRELATIONS FOR LOCUS OF CONTROL MEASURES

Variable	IAR+	IAR-	NSLCSC
IAR+	....	....	....
IAR-	.126	....	....
NSLCSC	.241	.473*	....

*p<.01 (two tailed)

TABLE 4

REGULAR CLASS GROUP

PRODUCT-MOMENT CORRELATIONS FOR LOCUS OF CONTROL MEASURES

Variable	IAR+	IAR-	NSLCSC
IAR+	....	....	....
IAR-	.112	....	....
NSLCSC	-.195	.083	....

TABLE 5

TOTAL SAMPLE

PRODUCT-MOMENT CORRELATIONS FOR LOCUS OF CONTROL MEASURES

Variable	IAR+	IAR-	NSLCSC
IAR+	....	....	....
IAR-	.114	....	....
NSLCSC	.005	.275*	....

*p<.05 (two tailed)

TABLE 6

PRODUCT-MOMENT CORRELATIONS FOR THE CEFT AND PRFT MEASURES OF FIELD ARTICULATION

Group	r (CEFT and PRFT)	p (two tailed)
Special Education	.479	p<.01
Regular Class	.436	p<.01
Total Sample	.443	p<.01

the relationship of the two personal styles, locus of control and field articulation. From a measurement perspective, the correlations between the locus of control measures and field articulation measures were indications of the discriminant validity of the measures of the individual traits.

As can be seen in Tables 7, 8, and 9, the relationship between the two styles, as measured by the IAR, NSLCSC, CEFT and PRFT, was negligible. None of the correlations exceeded ±.24, and, in most cases, hovered about the zero mark.

Hypothesis 4

It was hypothesized that the special education boys would be more external on the IAR and NSLCSC scales than regular classroom boys. To test this hypothesis, the locus of control raw scores for the two groups were compared with non-directional t-tests.

For the three locus of control measures, the scores of special education boys were more external than those of boys in regular classes. However, as indicated in Table 10, none of the differences reached statistical significance at the .05 level.

Hypothesis 5

Differences between the special education and regular class groups on the CEFT and PRFT measures of field articulation were assessed by non-directional t-test (Table 11). CEFT scores for special education boys were significantly lower than scores for regular classroom boys ($p<.05$). There were no differences between the two groups when field articulation was measured by the PRFT.

TABLE 7

SPECIAL EDUCATION GROUP

PRODUCT-MOMENT CORRELATIONS BETWEEN MEASURES OF LOCUS OF CONTROL AND MEASURES OF FIELD ARTICULATION

Variable	IAR+	IAR-	NSLCSC
CEFT	.088	-.053	-.244
PRFT	-.100	.011	-.196

TABLE 8

REGULAR CLASS GROUP

PRODUCT-MOMENT CORRELATIONS BETWEEN MEASURES OF LOCUS OF CONTROL AND MEASURES OF FIELD ARTICULATION

Variable	IAR+	IAR-	NSLCSC
CEFT	.010	.238	.083
PRFT	-.070	.187	.102

TABLE 9

TOTAL SAMPLE

PRODUCT-MOMENT CORRELATIONS BETWEEN MEASURES OF LOCUS OF CONTROL AND MEASURES OF FIELD ARTICULATION

Variable	IAR+	IAR-	NSLCSC
CEFT	.087	.099	-.001
PRFT	-.075	.106	-.033

TABLE 10

t-TESTS FOR LOCUS OF CONTROL SCORES OF SPECIAL EDUCATION AND REGULAR CLASS BOYS

	Special Education Group		Regular Class Group			
Variable	$\bar{X}$	s	$\bar{X}$	s	t	p
IAR+	12.60	2.30	13.08	2.14	.915	p>.35
IAR-	10.06	2.45	10.61	2.35	.973	p>.30
NSLCSC	21.60	4.02	23.39	5.21	1.624	p>.10

Note: High scores indicate an internal locus of control.

TABLE 11

t-TESTS FOR FIELD ARTICULATION SCORES OF SPECIAL EDUCATION AND REGULAR CLASS BOYS

	Special Education Group		Regular Class Group			
Variable	$\bar{X}$	s	$\bar{X}$	s	t	p
CEFT	16.60	3.52	18.58	3.01	2.547	$p<.05$
PRFT	151.40	46.39	154.31	56.63	.237	$p>.80$
PRFT (2 extreme scores removed)	151.40	46.39	162.74	45.64	1.023	$p>.30$

Note: High scores indicate field articulation (field independence).

The regular class sample included two boys with extremely field dependent PRFT scores (raw score of 11). The next lowest score in the entire sample was 41. If a normal distribution is assumed, the probability of getting a score of 11 is less than .001. The influence of these two extreme scores might have hidden differences between the groups on the PRFT test. However, when these two scores were removed, and the groups were again compared, no significant difference in PRFT scores was found.

Performance of the special education and the regular classroom boys on the field articulation measures is graphically illustrated in Figures 2 and 3.

Examination of the correlations between the descriptive variables and the personal style variables revealed some interesting relationships (see Appendix D for complete correlational results). For the special education boys, IAR- scores of internal responsibility for failure were positively related to age ($p<.05$), but negatively related to the Vocabulary and the Mean Verbal score ($p<.05$). No such relationships were observed for regular classroom boys.

The Nowicki-Strickland locus of control scale was positively related to the Information and the Mean Verbal scores ($p<.05$) for the total sample. This was some indication that verbal ability is involved in this particular measure of locus of control.

Significant relationships were observed between the CEFT and all three indicators of verbal ability for the total sample ($p<.01$). Vocabulary and Mean Verbal scores were also significantly related to CEFT scores in the separate analyses of special education boys and regular classroom

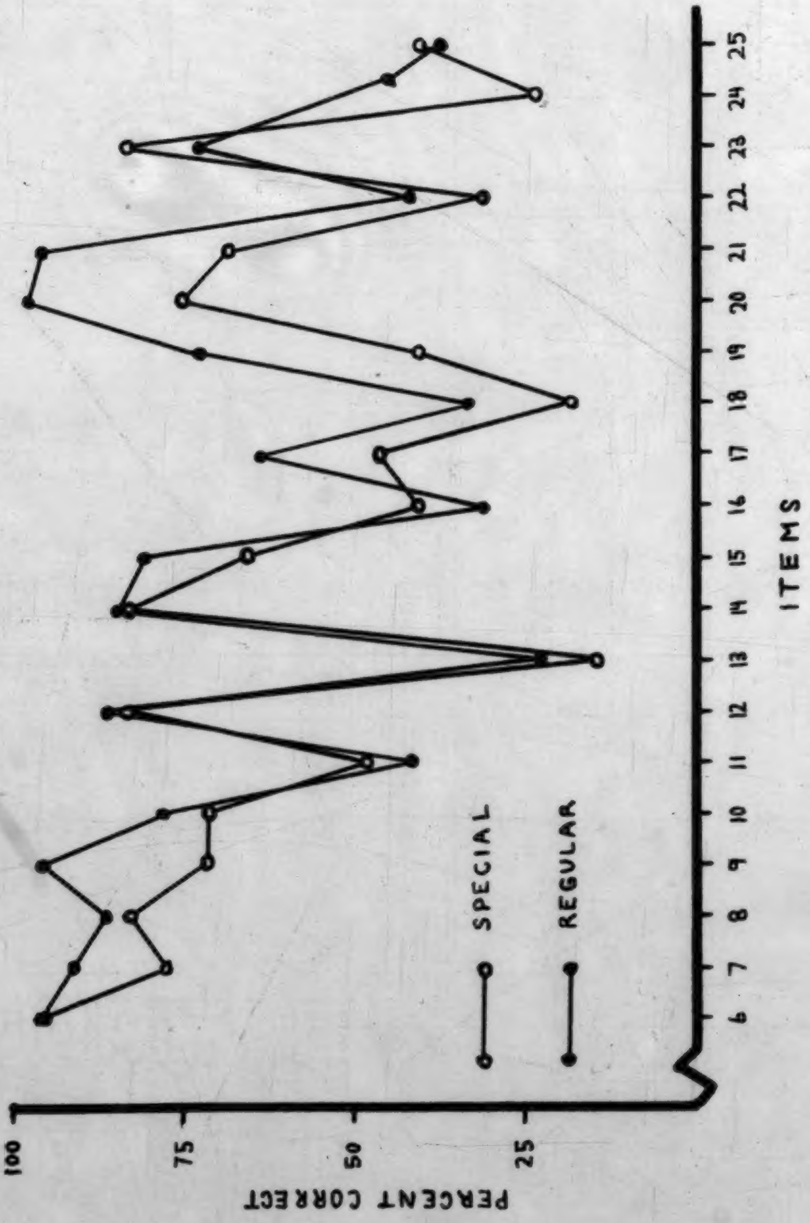

Figure 3. Performance of Special Education and Regular Class boys on the CEFT.

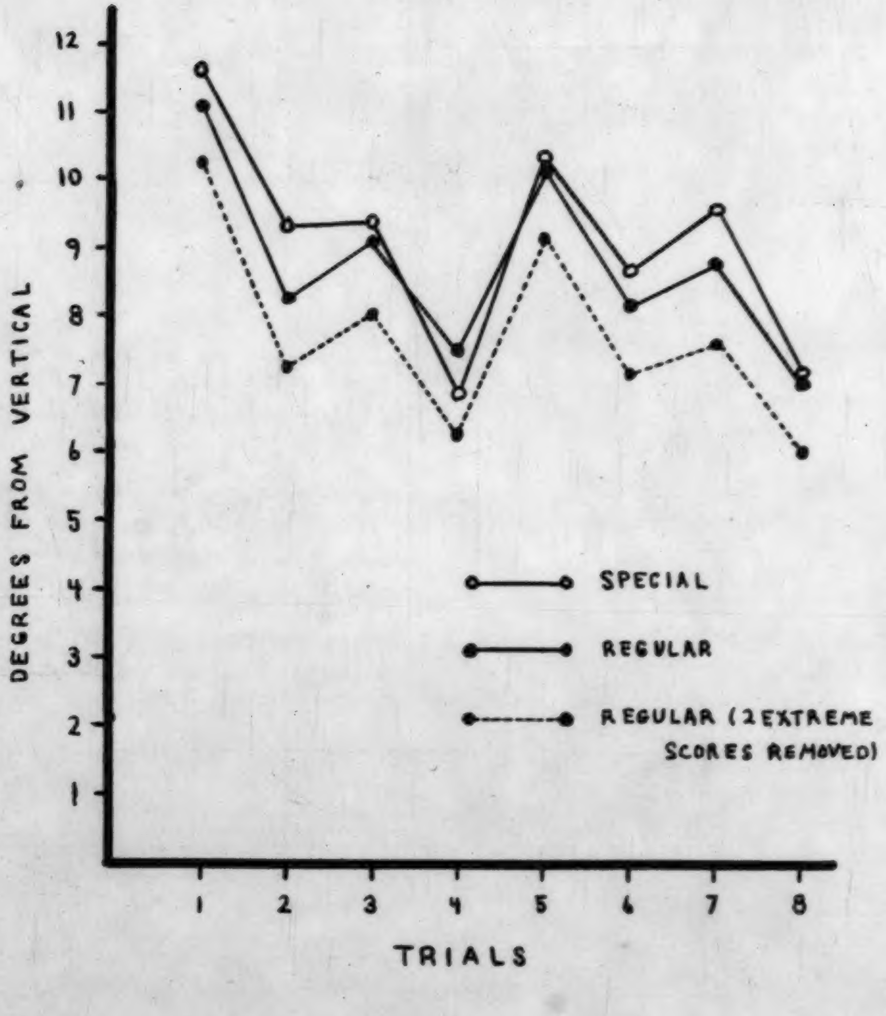

Figure 4. Performance of Special Education and Regular Class boys on the PRFT.

boys ($p<.05$). General intellectual ability appears to be involved in embedded figures test performance.

The relationship of verbal intellectual ability with NSLCSC and CEFT scores leads to the suspicion that the significant CEFT differences, and the near-significant NSLCSC differences between special education and regular classroom boys may be attributable to group differences in verbal intelligence.

Commonly used methods of statistically controlling secondary variables, such as verbal intelligence in the present example, are analysis of covariance and partial correlation. A number of authors have argued that the statistical removal of nuisance variables distorts the meaning of naturally occurring relationships.

> When we partial out, or control the effects of nuisance variables we change the nomological network in which the variables of interest are embedded. Or, put another way, the relationships among residual variables are simply not the same as the relationships among the original variables. We cannot interpret the residual variables as if they had the same construct status as the original variables [Maguire & Haig, 1975, p. 14].

The validity of this argument is acknowledged. However, the significance of NSLCSC and CEFT differences was re-analyzed with WISC Verbal Ability held constant. The intention of this analysis was not to make assumptions about hypothetical groups of boys of equal verbal intelligence. Rather, it was intended to illustrate the extensive verbal intelligence component of, particularly, the CEFT.

A summary of the one-way analysis of covariance with mean WISC Verbal scores as covariate, and NSLCSC and CEFT scores as dependent variables, is found in Table 12. The analysis of covariance provided additional evidence of the large general intelligence aspect of the CEFT.

TABLE 12

ANALYSIS OF COVARIANCE WITH MEAN WISC VERBAL SCORE AS COVARIATE

Dependent Variable	Source	d.f.	M.S.	F	P
NSLCSC	Groups	1	5.748	.271	.604
	Error	68	21.213		
CEFT	Groups	1	2.810	.299	.586
	Error	68	9.397		

Note: Homogeneity of variance and homogeneity of regression coefficients have been maintained.

Differences between the special education and regular class groups on the CEFT completely disappeared when the mean WISC verbal scores were covaried. The near-significant differences on the NSLCSC also disappeared in the analysis of covariance. The magnitude of the relationship between mean WISC scores and the CEFT is such that no implications of directional relationships can be derived. The two variables are confounded so that one could not say whether CEFT is part of general intelligence, or general intelligence is part of the CEFT. In the same way, no directional relationship between NSLCSC and general intelligence is assumed.

Chapter VI

DISCUSSION AND IMPLICATIONS

The essentially negative results of the present research study have important implications for future research involving the locus of control and field articulation personal styles.

Locus of Control

The low intercorrelations of the various locus of control questionnaires suggest serious problems of convergent validity. The convergent validity of a test can be demonstrated by significant correlations with other tests purporting to measure the same psychological construct. In this study, only the correlations between IAR- and NSLCSC scores for special education boys and for the total sample reached significance. These two correlations were difficult to interpret in view of the observed lack of differences between special education and regular class groups on any of the locus of control measures. The relationship between these two locus of control scales was likely confounded by the associations of the IAR- scores with age and verbal intellectual ability for the special education boys.

The insignificant relationships between the IAR+ and IAR- subscales raises questions about the advisability of using a total IAR score as a measure of internality. Clearly, responsibility for academic successes and responsibility for academic failures, as measured by the IAR, are independent belief states. Further research using the IAR questionnaire as in index of locus of control beliefs should be reported in terms of separate IAR+ and IAR- scores.

Two types of explanation are offered for the low intercorrelations of the locus of control measures. In the first place, the insignificant relationships may be a function of the questionnaires themselves. The standardization monographs for both the IAR and the NSLCSC have reported only moderate test reliabilities. The considerable measurement error generated by tests with .5 to .7 reliabilities may be responsible for the virtual absence of locus of control intercorrelations in this research.

The small variance and restricted ranges of the IAR+ and IAR- scales may have hindered adequate differentiation of degrees of locus of control beliefs. This may have depressed correlations with the Nowicki-Strickland questionnaire.

A second line of explanation involves the nature of the locus of control construct. From a theoretical perspective, the research results suggest limited generality of the locus of control personal style. With the measures used in this research, internal-external beliefs apparently vary depending on the type of external forces involved (persons vs. impersonal forces, luck, and fate), the situation (general vs. school setting), and the type of experience (success vs. failure).

Mischel (1973) has argued that expectancies become specific to certain situations. Further research is needed to investigate whether situation-specific locus of control beliefs can be validly assessed. Measures of generalized locus of control expectancies would seem to be of limited use in psychological explanation. The important and, as yet, unanswered questions concern the *extent* of general and specific expectancies in an individual's behaviors. Clearly, both types of expectancy are involved to some degree.

Locus of control expectancy in children is a psychological construct that has been projected downwards from research that originally involved only adult subjects. It may be that children's locus of control beliefs tend to be less consistent and generalized than adults'. It is not until a child reaches a certain level of cognitive sophistication that he can make abstractions and generalizations about his experience. The low intercorrelations of locus of control measures observed in the present research may be due, in part, to the child-like tendency to relate questionnaire items to recent, specific experiences.

One of the major implications of this research is that "locus of control" has little meaning as a descriptive term unless qualified by the assessment device used to determine one's position on the internal-external continuum. An example can be provided from the present data. If "internality" is defined by a score above the group mean score on a locus of control questionnaire, 20 boys in the regular class group would be so designated based on IAR- scores. Sixteen boys would be classified as internal on the basis of NSLCSC scores. Only 9 boys would be described as internal by both measures.

The growing research literature describing the characteristics and correlates of internal and external functioning is indeed based on shaky ground when different locus of control measures do not identify the same people. Research results using the present locus of control measures should be evaluated very tentatively. This is particularly so considering the value judgements typically applied to internal and external locus of control beliefs.

An interesting question for further research concerns those individuals for whom a consensus of locus of control scores can be found. These individuals may provide a clearer picture of the relationships between locus of control and other variables.

Field Articulation

Correlations between the CEFT and the PRFT measures of field articulation ranged from .44 to .48 and were significant in all cases. The results were comparable to those obtained in other research studies using similar measures (Dreyer, Dreyer & Nebelkopf, 1971; Keogh & Ryan, 1971; Nesbit, 1973).

The significant correlations ($p<.01$) imply convergent validity of the CEFT and PRFT tests. The two measures appear to be tapping a common dimension although considerable variance is unexplained.

Particularly noteworthy in this study were the significant relationships of the CEFT with verbal measures of general intelligence, and the absence of such relationships for the PRFT. These results are consistent with the positions of Horn (in press) and Vernon (1972) who have suggested that embedded figures tests and rod and frame tests involve basically different factors. Embedded figures tests appear to be heavily saturated with a general intelligence factor (Dubois & Cohen, 1970; Kagan & Kogan, 1970: Vernon, 1972, Wachtel, 1972; Zigler, 1963a,b). They also involve a general visualization factor (Horn). The rod and frame test, on the other hand, is relatively independent of general intelligence and seems to involve a distinct visuokinesthetic factor (Vernon, 1972).

Clinical observations during the present research support the contention that the CEFT involves general intellectual ability. For some children who scored well on the CEFT, the figures did not "pop out" of their embedded context. These children systematically searched the pictures, sometimes verbally rehearsing the salient properties of the stimulus figure. Success for these children was largely a function of their persistence and problem solving ability.

The analysis of covariance demonstrated the large involvement of general intelligence in the CEFT. The involvement is such that one might reasonably ask what remains when the effects of general intelligence are removed from the CEFT. Previous research, coupled with the results of the present study, would suggest that the CEFT is a marker of general intelligence, much like the WISC Block Design subtest with which the CEFT strongly correlates. As Horn has said, CEFT may also be considered a marker of general visualization abilities. Satterly's (1976) results indicated "the existence of a small factor of [personal] style distinct from intelligence and spatial ability" (p. 40). This small style factor did not appreciably improve prediction by IQ scores of most achievement test scores. There was some relationship between the EFT style factor and mathematics performance.

The different patterns of correlations for the CEFT and the PRFT and the moderate intercorrelations of these two measures have implications for the usefulness of the broad construct of field articulation. Field articulation measures in isolation may not be tapping the same construct. Unfortunately, some of the researchers using the field independence or field articulation constructs have used a single indicator of that style. Generalization from research using different measures of field articulation is not recommended.

The style characteristics associated with the field articulation construct may more parsimoniously be attributed to general intelligence or general visualization ability (CEFT), or to a visuokinesthetic factor (PRFT). It remains to be seen whether any distinct personal characteristics are associated with persons identified by both of Witkin's measures.

As with the locus of control measures, those persons labelled field independent or field dependent on one measure may not be similarly labelled by another test of field independence. With the present data, 13 special education boys would be labelled field independent with above average scores for their group on the CEFT and the PRFT. However, 19 boys would be described as field independent by the CEFT and 20 by the PRFT. Even with an intercorrelation of .479, there is considerable imprecision involved in the identification of individual personal style. This imprecision should be taken into consideration in the interpretation of any single-measure studies of field articulation.

The popularity of the field articulation personal style has led to the development of many versions of Witkin's original measures (Keogh, 1973). The interpretation of field articulation research is made difficult by the proliferation of such tests which often have only face validity in comparisons with each other and with the original measures (Vernon, 1972).

Locus of Control and Field Articulation

Research results showed essentially a zero relationship between locus of control measures and field articulation measures for a sample of 9—11 year old boys. These findings are in agreement with those of a number of other researchers (see Chapter II).

The low cross-trait correlations observed in the present research may be a function, in part, of between method variance. Both locus of control measures used the same questionnaire method of assessment which was completely different from the field articulation assessment devices.

This suggestion loses some credibility in face of the low inter-questionnaire correlations. However, it is suggested that future research use as many methods of assessing personal styles as is possible. In the current example, teachers might have been given descriptions of the personal style continua and asked to rank their students according to these style dimensions. Another possibility is a behavioral assessment of the psychosocial associates of the locus of control and field articulation styles.

Assuming, for the moment, reasonable reliabilities and validity of the locus of control measures, the low style intercorrelations may reflect upon the generality of the differentiation hypothesis. The description of locus of control expectancies is theoretically quite similar to certain aspects of the differentiation hypothesis, namely the development of a sense of separate identity. If indeed the locus of control construct is similar to this aspect of the differentiation hypothesis, one might argue that scores on field independence tests should not be inferentially associated with such a broad set of psychosocial attributes. Some caution should be exercised in generalizing from perceptual measures to non-perceptual traits.

There are, however, some differences between the locus of control construct and the sense of separate identity aspect of the field articulation style which might explain the negligible relationships between the two styles. Field articulation refers more to the development of an individual identity, whereas locus of control refers to the control which that individual exercises. For example, it is theoretically quite possible to be articulated in Witkin's sense (i.e. a separate self from the environment), but to perceive oneself as a pawn of environmental forces. Interestingly enough, however, both style constructs have been related to suggestibility and social conformity (Lefcourt, 1972; Witkin & Berry, 1975; Witkin et al., 1962).

Witkin and Berry have argued that "differentiation refers to structural rather than content properties of an individual's makeup and so is content free" (p. 11). There may not necessarily be a relationship between the culture-specific locus of control beliefs and the more generalized differentiation structures.

It is possible that the locus of control questionnaires may have permitted certain individuals to report beliefs disparate from their behaviors. Hochreich (cited in Baron et al., 1974) has differentiated between "real" externals and "defensive" externals (persons with strong achievement striving who report external beliefs to protect themselves from responsibility for failure). The questionnaires are also susceptible to a social desirability response factor. These two potential response tendencies may have contributed to the low correlations between locus of control and field articulation scores.

Personal Styles and Special Education

Contrary to prediction, few style differences were found between special education and regular classroom boys. The only significant difference that was found was for the CEFT measure of field articulation. This difference appears to be largely a function of the differences in verbal intellectual ability between the two groups. The CEFT differences might also reflect attentional difficulties of the special education boys. This hypothesis is consistent with the positions of Douglas (1972) and

Tarver and Hallahan (1974).

As has been previously mentioned, the scores for locus of control questionnaires are particularly susceptible to error due to a tendency to give socially desirable responses. One explanation for the lack of locus of control differences between groups is the possibility of some special education boys providing socially desirable responses.

The most likely explanation for the insignificant differences involves the many similarities of special education and regular classroom boys, and the tremendous variation amongst the boys in both educational settings. McCarthy and Paraskevopoulos (1969) found a high degree of similarity between the factorial structure of the ratings of emotionally disturbed, learning disabled and average children. Conduct problem behavior (restlessness, disruptiveness, attention seeking, irresponsibility, tension, hyperactivity, distractibility, etc.) was evident in all three categories of children studied. Differences existed only in frequency and severity of behaviors.

Numerous authors have commented on the heterogeneity of children in learning disability classrooms (e.g. Clements, 1971; Lovitt, 1975). Perhaps the most important implication of the present research is a reaffirmation of the individuality of all students, whatever their educational placement. Broad classificatory labels (e.g. special education boys, regular classroom boys) exist, and are essential for purposes of communication and administration. However, the teaching process must transcend the categories and deal with individual children. Assuming for the moment the validity and reliability of the personal style measures, the present research would indicate a wide range of individual style differences within adaptation and regular classrooms.

Future Implications

The personal style approach has generated a great deal of interest in the fields of education and psychology. It is hoped that recent research, including the present study, may slow the momentum of enthusiasm until construct validity and adequate reliability of the personal style measures are demonstrated.

Witkin (1972) has proposed that measures of personal style be used to replace traditional ability tests. Personal styles, he argued, are more comprehensive, spanning the areas of personality and cognition, and less judgemental in that they do not assess aptitudes along a 'more—less' continuum. These laudable aims in educational assessment cannot be achieved until the broad generality of individual personal styles is more strongly indicated. It is also unfortunately true, despite the best intentions of personal style theorists, that the well known personal styles have been closely associated with abilities, and do provoke 'more—less' value judgements.

It is generally accepted that test reliabilities of at least .80 are required for any measures being used for educational assessment and placement (Anastasi, 1968). In this regard, the field articulation measures are generally suitable; locus of control tests are not.

Psychological research, in recent years, has been marked by the search for what are known as Aptitude Treatment Interactions (ATIs). Cronbach (1957, 1975) has called for a reunion of the experimental and correlational streams of educational research to create "an educational psychology which measures readiness for different types of teaching and which invents teaching methods to fit different types of readiness" (1957, p. 681). Most of the research following the ATI model has not been successful in uncovering interaction effects. Often, this lack of success can be attributed to the absence of adequate measuring instruments for differentiating aptitude types (Ysseldyke, 1973).

Despite the questionable status of the locus of control and field articulation personal styles, numerous suggestions for specific aptitude-treatment interventions have been made. Without going into detail, Janzen and Beeken (1973) wrote:

> We can envision applications [of the locus of control construct] to guided discovery teaching methods, to student-directed learning, to lecture methods, graded and non-graded courses, mastery learning, behaviour modification, and other concerns of educational theory and practice [p. 301].

Kifer (1975) has suggested that a mastery learning format is a desirable approach for children with external locus of control beliefs. A locus of control x praise ATI effect was revealed in a study by Lintner and DuCette (1974). In an ambiguous coding task, praise significantly improved the performance of external males, but significantly worsened the performance of internal male students. Baron et al. (1974) found that internals perform better than externals with intrinsic feedback while externals perform better than internals with social feedback.

Using the field articulation personal style, Grieve and Davis (1971) found a significant interaction effect with "expository"/"discovery" teaching methods. Several authors have suggested that different teaching approaches and types of reinforcement are appropriate for global and analytic students (Campbell & Douglas, 1972; Witkin, 1972). Witkin also suggested that teachers and students be matched according to their personal styles.

Personal styles, such as locus of control and field articulation, may serve an important role in educational programming based on an ATI model. Early results are encouraging but limited. More definitive results might be expected with more precise measuring devices.

It should be made clear that this study has not ruled out the use of the locus of control and field articulation styles in certain specific situations. Good teachers have intuitively been aware of these style differences, and have reacted appropriately in their dealings with individual children. Formal use of a personal style approach, however, is not warranted by research results to date.

It is perhaps inevitable that modification of personal styles has been proposed by several authors (e.g. Campbell & Douglas, 1972; Wicker & Tyler, 1975). The direction of proposed change is towards the internal and articulated state which has been related to school achievement. Before modification programs are pursued, two important points should be considered. First, correlation of school achievement with internality and field articulation does not imply causation of one by the other. Modification of personal style is based on the assumption that personal style 'causes' school achievement, a relationship that has not yet been demonstrated. Secondly, modification is based upon value judgements as to the relative importance of certain style tendencies. Both ends of the internal-external and analytic-global continua are adaptive in certain situations. The issue is essentially an ethical one (Keogh, 1973). Perhaps the more desirable approach for educators to take is to respond to the individual differences of their students rather than attempting to fit the students to a common mould.

The personal style approach in education is attractive both because it focuses attention on the individuality of the child, and because it deals with the 'whole' child, bridging traditionally separate areas of cognition and personality. To date, the theoretical attractiveness of the locus of control and field articulation personal styles has not been documented by empirical research study. The primary value of the present study is to temper the well-intentioned enthusiasm of educators for the personal style approach until the practical utility of these styles is demonstrated.

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APPENDIX A

INTELLECTUAL ACHIEVEMENT RESPONSIBILITY QUESTIONNAIRE

IAR

NAME: ____

These questions are to find out about student's opinions. There are no right or wrong answers. For each question, choose the answer that is best for you. Please answer every question.

Your answers are private and will not be shown to anyone.

Circle the letter that is the best answer for each question.

1. If a teacher passes you to the next grade, would it probably be
   a. because she liked you, or
   b. because of the work you did?

2. When you do well on a test at school, is it more likely to be
   a. because you studied for it, or
   b. because the test was especially easy?

3. When you have trouble understanding something in school, is it usually
   a. because the teacher didn't explain it clearly, or
   b. because you didn't listen carefully?

4. When you read a story and can't remember much of it, is it usually
   a. because the story wasn't well written, or
   b. because you weren't interested in the story?

5. Suppose your parents say you are doing well in school. Is this likely to happen
   a. because your school work is good, or
   b. because they are in a good mood?

6. Suppose you did better than usual in a subject at school. Would it probably happen
   a. because you tried harder, or
   b. because someone helped you?

7. When you lose at a game of cards or checkers, does it usually happen
   a. because the other player is good at the game, or
   b. because you didn't play well?

8. Suppose someone doesn't think you are very bright or clever,
   a. can you make him change his mind if you try to, or
   b. are there some people who will think you're not very bright no matter what you do?

9. If you solve a puzzle quickly, is it
   a. because it wasn't a very hard puzzle, or
   b. because you worked on it carefully?

10. If a boy or girl tells you that you are dumb, is it more likely that they say that
    a. because they are mad at you, or
    b. because what you did really wasn't very bright?

11. Suppose you study to become a teacher, scientist, or doctor, and you fail. Do you think this would happen
    a. because you didn't work hard enough, or
    b. because you needed some help and other people didn't give it to you?

12. When you learn something quickly at school, is it usually
    a. because you paid close attention, or
    b. because the teacher explained it clearly?

13. When a teacher says to you, "Your work is fine," is it
    a. something teachers usually say to encourage pupils, or
    b. because you did a good job?

14. When you find it hard to work arithmetic or math problems at school, is it
    a. because you didn't study well enough before you tried them, or
    b. because the teacher gave you problems that were too hard?

15. When you forget something you heard in class, is it
    a. because the teacher didn't explain it very well, or
    b. because you didn't try very hard to remember?

16. Suppose you weren't sure about the answer to a question your teacher asked you, but your answer turned out to be right. Is it likely to happen
    a. because she wasn't as particular as usual, or
    b. because you gave the best answer you could think of?

17. When you read a story and remember most of it, is it usually
    a. because you were interested in the story, or
    b. because the story was well written?

18. If your parents tell you you're acting silly, and not thinking clearly, is it more likely to be
    a. because of something you did, or
    b. because they happen to be feeling cranky?

19. When you don't do well on a test at school, is it
    a. because the test was especially hard, or
    b. because you didn't study for it?

20. When you win at a game of cards or checkers, does it happen
    a. because you play really well, or
    b. because the other person doesn't play well?

21. If people think you are bright or clever, is it
    a. because they happen to like you, or
    b. because you usually act that way?

22. If a teacher doesn't pass you to the next grade, would it probably be
    a. because she "had it in for you", or
    b. because your school work wasn't good enough?

23. Suppose you didn't do as well as usual in a subject at school. Would this probably happen
    a. because you weren't as careful as usual, or
    b. because someone bothered you and kept you from working?

24. If a boy or girl tells you that you are bright, is it usually
    a. because you thought up a good idea, or
    b. because they like you?

25. Suppose you became a famous teacher, scientist, or doctor. Do you think this would happen
    a. because other people had helped you when you needed it, or
    b. because you worked very hard?

26. Suppose your parents say you aren't doing well in your school work. Is this likely to happen more
    a. because your work isn't very good, or
    b. because they are feeling cranky?

27. Suppose you are showing a friend how to play a game and he has trouble with it. Would that happen
    a. because he wasn't able to understand how to play, or
    b. because you couldn't explain it well?

28. When you find it easy to work arithmetic or math problems at school, is it usually
    a. because the teacher gave you especially easy problems, or
    b. because you studied your book well before you tried them?

29. When you remember something you heard in class, is it usually
    a. because you tried hard to remember, or
    b. because the teacher explained it well?

30. If you can't work a puzzle, is it more likely to happen
    a. because you're not especially good at working puzzles, or
    b. because the instructions weren't written clearly enough?

31. If your parents tell you that you are bright or clever, is it more likely
    a. because they are feeling good, or
    b. because of something you did?

32. Suppose you are explaining how to play a game to a friend and he learns quickly. Would that happen more often
    a. because you explained it well, or
    b. because he was able to understand it?

33. Suppose you're not sure about the answer to a question your teacher asks you and the answer you give turns out to be wrong. Is it likely to happen
    a. because she was more particular than usual, or
    b. because you answered too quickly?

34. If a teacher says to you, "Try to do better," would it be
    a. because this is something she might say to get her pupils to try harder, or
    b. because your work wasn't as good as usual?

*****

APPENDIX B

NOWICKI-STRICKLAND LOCUS OF CONTROL SCALE FOR CHILDREN

NS

NAME: ____

These questions are to find out about students' opinions. There are no right or wrong answers. For each question, answer "yes" or "no". Choose the answer that is best for you. Please answer all of the questions.

Your answers are private and will not be shown to anyone.

Check "yes" or "no" for each question.

1. Do you believe that most problems will solve themselves if you just don't fool with them?
   Yes______ No______

2. Do you believe that you can stop yourself from getting a cold?
   Yes______ No______

3. Are some kids just born lucky?
   Yes______ No______

4. Most of the time do you feel that getting good grades means a great deal to you?
   Yes______ No______

5. Are you often blamed for things that just aren't your fault?
   Yes______ No______

6. Do you believe that if someone studies hard enough he or she can pass any subject?
   Yes______ No______

7. Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyways?
Yes______ No______

8. Do you feel that if things start out right in the morning that it's going to be a good day no matter what you do?
Yes______ No______

9. Do you feel that most of the time parents listen to what their children have to say?
Yes______ No______

10. Do you believe that wishing can make good things happen?
Yes______ No______

11. When you get punished does it usually seem for no good reason at all?
Yes______ No______

12. Most of the time do you find it hard to change a friend's mind (opinion)?
Yes______ No______

13. Do you think that cheering more than luck helps a team to win?
Yes______ No______

14. Do you feel that it's nearly impossible to change your parent's mind about anything?
Yes______ No______

15. Do you believe that your parents should allow you to make most of your own decisions?
Yes______ No______

16. Do you feel that when you do something wrong that there's very little you can do to make it right?
    Yes______ No______

17. Do you believe that most kids are just born good at sports?
    Yes______ No______

18. Are most of the other kids your age stronger than you?
    Yes______ No______

19. Do you feel that one of the best ways to handle most problems is just not to think about them?
    Yes______ No______

20. Do you feel that you have a lot of choice in deciding who your friends are?
    Yes______ No______

21. If you find a four leaf clover do you believe that it might bring you good luck?
    Yes______ No______

22. Do you often feel that whether you do your homework has much to do with what kind of grades you get?
    Yes______ No______

23. Do you feel that when a kid your age decides to hit you, there's little you can do to stop him or her?
    Yes______ No______

24. Have you ever had a good luck charm?
    Yes______ No______

25. Do you believe that whether or not people like you depends on how you act?

Yes______ No______

26. Will your parents usually help if you ask them to?

Yes______ No______

27. Have you felt that when people were mean to you it was usually for no reason at all?

Yes______ No______

28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?

Yes______ No______

29. Do you believe that when bad things are going to happen they just are going to happen no matter what you try to do to stop them?

Yes______ No______

30. Do you think that kids can get their own way if they just keep trying?

Yes______ No______

31. Most of the time do you find it useless to try to get your own way at home?

Yes______ No______

32. Do you feel that when good things happen they happen because of hard work?

Yes______ No______

33. Do you feel that when someone your age wants to be your enemy there's little you can do to change matters?
Yes______ No______

34. Do you feel that it's easy to get friends to do what you want them to?
Yes______ No______

35. Do you usually feel that you have little say about what you get to eat at home?
Yes______ No______

36. Do you feel that when someone doesn't like you there's little you can do about it?
Yes______ No______

38. Are you the kind of person who believes that planning ahead makes things turn out better?
Yes______ No______

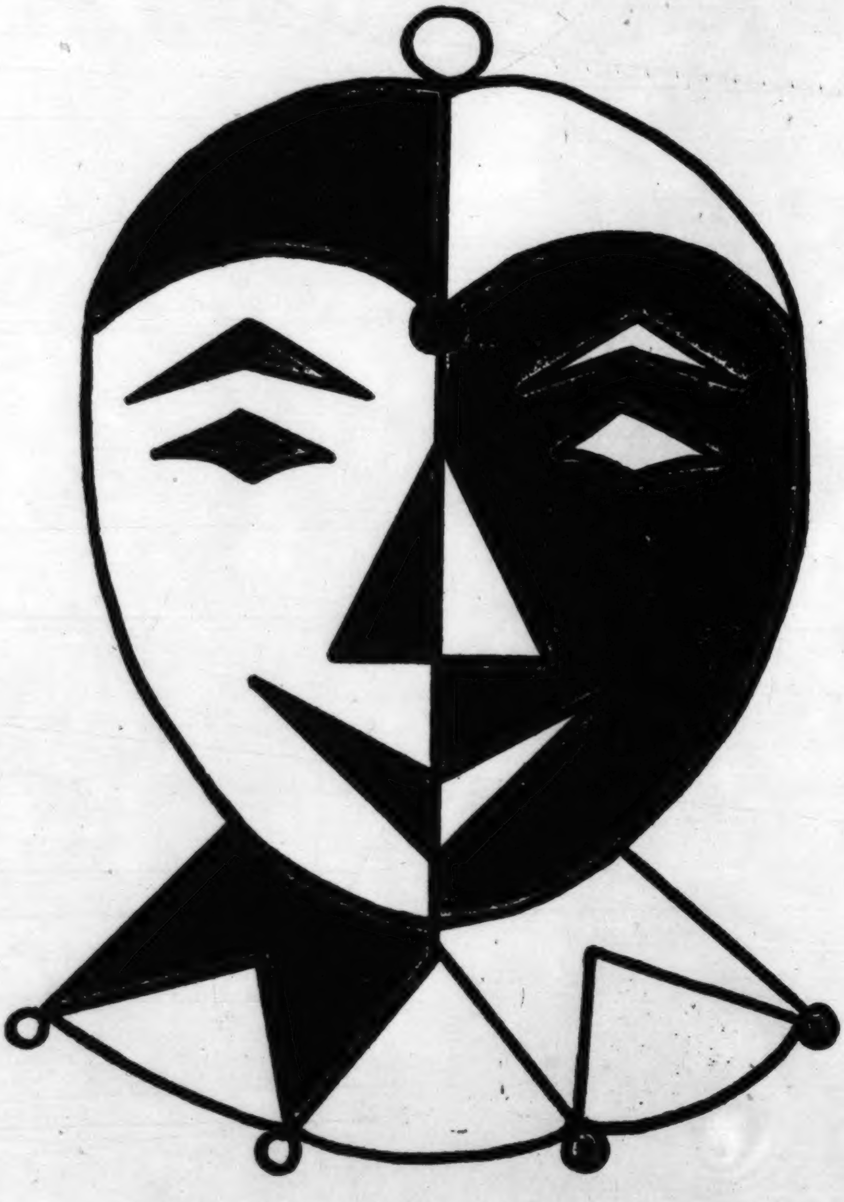
39. Most of the time, do you feel that you have little to say about what your family decides to do?
Yes______ No______

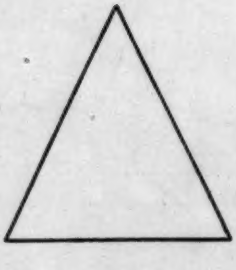
40. Do you think it's better to be smart than to be lucky?
Yes______ No______

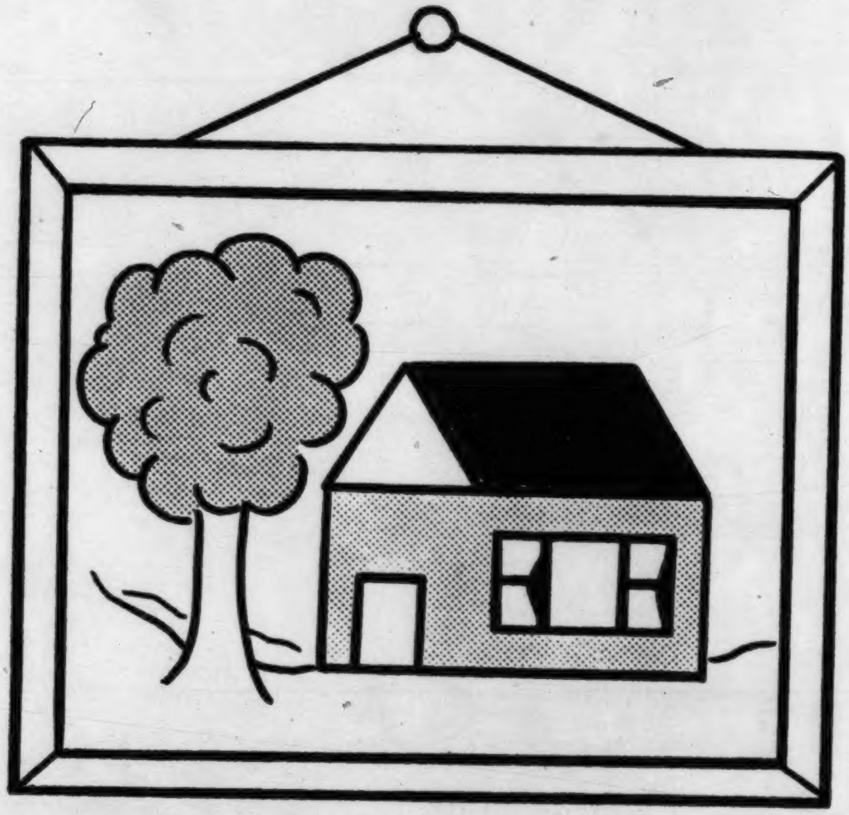
*****

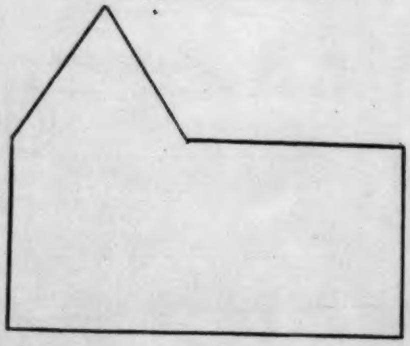
APPENDIX C

SPECIMENS FROM THE CHILDREN'S EMBEDDED FIGURES TEST









APPENDIX D

CORRELATIONAL MATRICES FOR THE SPECIAL EDUCATION GROUP, THE REGULAR CLASS GROUP, AND THE TOTAL SAMPLE

CORRELATIONAL MATRIX FOR THE SPECIAL EDUCATION GROUP

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age										
2. SES	-.133									
3. Inf.	-.081	.137								
4. Vocab.	-.044	.148	.421*							
5. WISC $\bar{X}$	-.074	.169	.836**	.850**						
6. IAR+	.187	-.043	.293	.093	.227					
7. IAR-	.418*	-.128	-.235	-.332*	-.337*	.126				
8. IAR^{tot}	.418*	-.114	.036	-.170	-.082	.724**	.772**			
9. NSLCSC	.300	.017	-.033	-.026	-.035	.241	.473**	.477*		
10. CEFT	.022	.296	.147	.423*	.341*	.088	-.053	.014	-.244	
11. PRFT	.071	.125	.088	.027	.068	-.100	.011	-.045	-.196	.479**

*p<.05 (two tailed)

**p<.01 (two tailed)

CORRELATIONAL MATRIX FOR THE REGULAR CLASS GROUP

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age										
2. SES	-.152									
3. Inf.	-.376*	.296								
4. Vocab.	-.579**	.089	.677**							
5. WISC $\bar{X}$	-.511**	.220	.932**	.898**						
6. IAR+	-.043	.216	-.048	-.227	-.141					
7. IAR-	-.235	.133	.034	-.006	.017	.112				
8. IAR^{tot}	-.191	.237	-.007	-.152	-.079	.719**	.771**			
9. NSLCSC	.066	.219	.316	.252	.313	-.195	.083	-.063		
10. CEFT	-.091	-.128	.315	.469**	.420*	.010	.238	.168	.083	
11. PRFT	.320	.197	.131	.074	.115	-.070	.187	.091	.102	.436**

*p<.05 (two tailed)

**p<.01 (two tailed)

CORRELATIONAL MATRIX FOR THE TOTAL SAMPLE

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age										
2. SES	-.139									
3. Inf.	-.186	.310**								
4. Vocab.	-.239*	.199	.674**							
5. WISC $\bar{X}$	-.230	.283*	.929**	.900**						
6. IAR+	.095	.116	.137	-.014	.074					
7. IAR-	.165	.029	-.001	-.094	-.047	.114				
8. IAR^{tot}	.179	.097	.084	-.079	.010	.724**	.767**			
9. NSLCSC	.177	.168	.264*	.214	.263*	.005	.275*	.197		
10. CEFT	-.027	.157	.338**	.503**	.452**	.087	.099	.119	-.001	
11. PRFT	.165	.173	.115	.063	.100	-.075	.106	.030	-.003	.443**

*$p<.05$ (two tailed)

**$p<.01$ (two tailed)

APPENDIX E

PERSONAL STYLE RAW DATA — SPECIAL EDUCATION AND REGULAR CLASS GROUPS

LOCUS OF CONTROL RAW DATA

	SPECIAL EDUCATION			REGULAR CLASS		
S's	IAR+	IAR-	NSLCSC[a]	IAR+	IAR-	NSLCSC
1	14	12	22	15	10	17
2	14	10	18	14	11	27
3	14	11	22	14	10	26
4	13	12	23	12	13	23
5	15	11	27	8	10	34
6	12	10	23	11	13	20
7	11	5	19	14	13	26
8	11	11	15	16	11	23
9	11	11	26	12	8	32
10	13	10	27	15	12	26
11	14	12	17	15	14	32
12	10	13	24	11	10	25
13	16	12	29	7	9	26
14	14	14	21	11	8	23
15	12	10	13	15	12	29
16	13	12	22	12	11	20
17	13	8	25	13	12	37
18	16	6	19	10	15	23
19	11	6	13	13	11	23
20	9	9	20	13	12	28
21	8	9	21	13	5	19
22	9	9	24	15	12	19
23	13	6	19	13	6	28

(Cont'd)

LOCUS OF CONTROL RAW DATA (Cont'd)

	SPECIAL EDUCATION			REGULAR CLASS		
S's	IAR+	IAR-	NSLCSC[a]	IAR+	IAR-	NSLCSC
24	12	9	21	15	8	21
25	17	12	24	13	12	24
26	8	12	24	15	14	16
27	14	10	20	13	9	21
28	14	14	28	14	9	16
29	15	10	24	11	12	18
30	15	6	19	12	8	19
31	12	10	20	15	7	24
32	12	5	16	16	13	19
33	9	12	20	15	13	24
34	15	12	27	16	9	17
35	12	11	24	11	9	17
36				13	11	20

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[a] NSLCSC scores are scored in an internal direction for this study. To convert these scores to the traditional NSLCSC scores, subtract raw scores from 40.

FIELD ARTICULATION RAW DATA

	SPECIAL EDUCATION		REGULAR CLASS	
S's	CEFT	PRFT[a]	CEFT	PRFT
1	22	210	23	188
2	19	87	19	127
3	17	194	16	191
4	17	185	23	188
5	20	187	14	193
6	13	120	25	211
7	23	211	23	208
8	20	179	20	173
9	14	169	22	150
10	17	182	22	197
11	13	192	20	151
12	14	104	16	59
13	15	141	22	170
14	13	198	21	181
15	23	202	20	152
16	16	164	22	210
17	13	60	21	209
18	11	131	15	174
19	20	207	17	175
20	18	194	14	53
21	14	157	17	175
22	10	159	20	195
23	18	147	18	138

(Cont'd)

FIELD ARTICULATION RAW DATA (Cont'd)

	SPECIAL EDUCATION		REGULAR CLASS	
S's	CEFT	PRFT[a]	CEFT	PRFT
24	17	183	17	11
25	19	129	16	193
26	16	165	20	185
27	13	126	19	94
28	12	61	17	142
29	20	95	18	11
30	17	149	15	167
31	22	188	16	182
32	12	55	18	213
33	15	63	17	101
34	19	149	13	41
35	19	156	16	159
36			17	188

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[a] PRFT scores are scored in a field independent direction for this study. To convert these scores to the traditional PRFT scores, subtract raw scores from 224.